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Reshaping U.S. Mineral Policy

IT is clear that American mineral policy is being reformed. What makes it difficult to forecast the likely outcome is the present state of the economy. The economy is moving sideways. That seems now likely to change; but it is much harder to say in what direction it is about to move.

Over the past half-year the seasonally corrected index of production of the Federal Reserve Board has remained (with the exception of one month) unchanged; unemployment is higher than last year but this was mostly due to the use of different figures and it is in any case falling; retail prices are rising by around 4 per cent a year although there has been a fall in wholesale prices largely due to the fall in metal prices; motor sales have been disappointing but other consumer sales have not been unduly low. In other words, the signs that the economy is moving into a downturn can be counterbalanced by signs that it is moving into a new phase of expansion. The difficulties of forecasting are further increased by the political crisis that surrounds the Budget. The Budget itself may well be inflationary because of its sheer size, but some of the wilder talk of tax and spending cuts may be equally inflationary if put to effect. And at the moment nobody knows how the Budget struggle will go. Furthermore, the health of the economy is closely linked to the personal well-being of the President. If the President suffers a defeat over the Budget he may lose prestige and control of the government (especially as he is incapable of holding office and therefore of dispensing patronage in three years' time) fairly rapidly.

It is in this sort of uncertainty that mineral policy is being reshaped. One thing can be taken for granted. The view of all but the very immediate future is assumed to be favourable. Expansion is the basic assumption and planning on any other basis is thought not to make sense. Therefore, while accepting the reservation that immediate economic or political difficulties may suddenly determine the choice between alternative courses, the greatest attention should be paid to the estimated American demands put forward recently by Mr. Felix Wormser, Assistant Secretary of the Interior for Mineral Resources.

"What can happen to the demand for raw materials in the days ahead as we export our ideas and industrial technology to less fortunate foreign areas almost staggers the imagination," he said. American iron ore consumption will increase by 15-25 per cent by 1975 and nearly all the increase will have to be imported; aluminium consumption will be two to three times the present rate but domestic output will double; also by 1975 the value of titanium output will have risen beyond that of lead; consumption of lead, zinc, copper and the rarer metals will continue to grow.

In other words the first pre-requisite of a new American mineral policy should be that it will take account of this vast increase in potential demand. It would be a short-sighted policy from the American point of view to protect diminishing American resources at the expense of the foreign deposits that America will come more and more to depend on; at the same time, it would be politically dangerous to export American technology and not to find the raw material resources to feed it.

Now the difficulty about previous American stockpiling schemes is that they have not been able to reconcile strategic with economic interests. Sometimes the law has forbidden the stockpilers even to try. For instance, the American stockpiling boom that followed the Korean War was carried out for strategic reasons and with disastrous economic consequences; the stockpilers were forbidden to take note of the market. On the other hand the supplemental stockpile is being accumulated by careful regard for the market and expensive purchases are eschewed; indeed, stockpilers are accused of driving hard bargains.

But if it is difficult to reconcile economic and strategic aims the question that now arises is, is there any reason any longer to try? What sensible strategic aims now underlie stockpiling except perhaps for small lots of the newer metals? The American piles are now big enough in every respect to survive the short war that nuclear bombs must entail. In other words, the way is now clear to carry out a new programme that would have blatantly economic objectives.

This, of course, is easily said. You can get away with most things if you can plead the country's strategic interests. But if you are carrying out a materials policy for economic ends then you must take note of the legitimate economic interests of a great many parties—and particularly those with votes. The difficulties are obviously greatest in respect of lead and zinc. But the American copper mines in 20 years' time might conceivably be in much the same sort of difficulties that lead and zinc mines are in now. Furthermore, the problem of getting a new materials policy past Congress would much diminish if it could be presented in global terms and not merely as a device for assisting a particular industry out of a particular difficulty. What may well emerge is an extension to the mining field of the idea of the soil bank whereby capacity is kept intact but actual output is allowed to decline. In other words, America would encourage the output of zinc and lead outside her shores both in the world interest of securing enough lead and zinc and in her own interest in getting lead and zinc as cheaply as anybody else. Meanwhile, her own mines would compete—if they could—or go on care-and-maintenance till the gradual rise in world prices brought them back into the market. Some additional protection would no doubt be necessary and some financial assistance to a few of the mines would also be required; but what the Americans would have to avoid are (a) allowing a flood of imports such as would close down a disastrous number of domestic mines and (b) what is the much greater present danger—raising tariffs to a level that would discourage output in the rest of the world while exhausting American resources and at the same time supplying American industry with high-cost raw materials. The role of stockpiling would then be not the mere accumulation of physical supplies but the holding out of guarantees of take-off to encourage the capital outlay involved in starting new mines and developments. A judicious combination of tariffs and direct subsidies would soften the worst—but only the worst—consequences to the American producers.

Such a policy would make sense but how far it would be politically acceptable is another matter. But what seems clear is that there is a growing recognition in Washington that stockpiling as at present practised is a wasteful way of securing its objectives, and secondly, that such has been the pre-occupation with the lead and zinc and Texan oil producers that the main purpose of American materials policy ever since Paley—the expansion of world supplies—is in danger of being lost sight of. It looks as if the United States is making an agonizing re-appraisal of its materials needs and in the process is rediscovering what its materials policy ought to be.

THE NEED FOR NUCLEAR POWER STATIONS

In a report published last week, the three-man committee of the Euratom Powers—Germany, France, Belgium, Italy, Luxembourg and Holland—stressed the urgency of the need for nuclear power stations. The report points out that at the present time the six countries import 22 per cent of their energy requirements (100,000,000 tons coal equivalent) compared with the 12 per cent imported by Britain and stresses that in ten years' time these figures would rise to 33 per cent and 22 per cent respectively—assuming dependence on conventional fuels. The British programme for nuclear power stations to produce 6,000,0000 kW. is expected to stabilize her imports of energy by 1965, and to achieve a corresponding result Euratom countries will require 15,000,000 kW. of nuclear power.

This is a very ambitious target bearing in mind that compared to Britain, Europe is almost without experience of developing nuclear power for peaceful purposes and the fulfilment of the programme advanced in the report will obviously depend almost entirely on the assistance of Britain and the U.S. who have already accumulated some considerable experience of this new form of energy. The cost of the new stations is estimated at £2,500,000,000—more than double that of installing conventional power stations of equivalent capacity. However, the apprehensions aroused by the recent disturbances in the Middle East have served to illustrate the necessity for Euratom countries to take immediate steps to lessen their dependence on oil from these sources.

In addition to this programme France plans to develop the oil resources of the Sahara and drilling so far undertaken suggests that the reserves of oil in this area are larger than anticipated and, in fact, this field may in future rival those being exploited elsewhere in the Middle East.

MINING PROGRESS IN NIGERIA

The year ended March 31, 1956, was one of steady progress rather than of spectacular achievement, states the annual report of the Mines Department of the Federation of Nigeria.

In the production of cassiterite there was a slight increase on the previous year and also in the market price. Exports during the financial year 1955-56 totalled 11,522 l.tons, valued at £6,122,452, compared with 11,107 tons, worth £5,566,177, in 1955.

The year opened with the U.S. Government purchasing programme for columbite still in operation, but there were early indications that this would not go on for long and at the end of May it was announced that no new contracts would be entered into. This was a serious blow to producers with no forward contracts and resulted in certain high-cost operators curtailing production and reducing their technical staff.

Efforts are being made to convince possible users that Nigeria has very large reserves of columbite and that this mineral can be supplied at a reasonable price. There are signs that the market is now settling down, but at a price substantially lower than the pre-bonus level. An interesting development is the production by Murex Ltd., in association wtih Accles and Pollock, of columbium metal tubes and sheet, which may be of importance in the construction of atomic energy reactors.

Despite the fall in prices and the uncertainty of the market, production and exports of columbite in 1955/56 at 2,989 and 2,798 tons respectively, were only 7 per cent lower than in the previous financial year.

As at March 31, 1956, estimated reserves of cassiterite stood at 134,822 tons (102,954 tons proved and 31,868 tons indicated). Reserves of columbite were estimated at 66,790 tons (55,392 tons proved and 11,398 tons indicated).

Production of tantalite at 2,101 tons more than doubled, Kabba Province again being the main source. As with columbite, prices showed a substantial drop.

The increase in gold production noted in 1954/55 was not maintained, the 1955/56 output (781.31 oz.) being the lowest recorded for many years. The Ilesha field remains the only significant producer. The value of the Iperindo ore body as at present exposed was completed, but results were not particularly encouraging. There was some revival of interest in Sokoto and Katsina Provinces.

A well-known mining engineer, Mr. Donald Gill, was engaged by N. M. Rothschild and Co. to report on the lead-zinc deposits on the Application for Special Mining Lease held by the Nigerian Lead-Zinc Mining Co. Ltd., near Abakaliki, in the Eastern Region. Work was mainly confined to driving and crosscutting on the 150 ft. and 250 ft. levels at Ameri, which appeared to be the most promising prospect. The Nigerian Governments of the Federation and Eastern Region agreed to underwrite a portion of the share issue up to the value of £350,000, should the report show that development was justified.

Considerable interest was shown in radioactive minerals. Shipments were made of thorite obtained from dumps and leases were granted covering alluvial deposits of monazite. The marketing of radioactive minerals recovered in primary columbite treatment plants was under consideration.

Coal production from the Enugu field continued to increase, the total for the financial year being 750,051 tons.

AIRBORNE PROSPECTING IN THE PHILIPPINES

From the Far East comes one of the few publishable accounts of how airborne minerals search teams are helping to beat the world shortage of base and ferrous metals. In 99 cases out of 100, the results of these surveys are confidential—client security is rigidly maintained until the mining company has staked its claims, and even then the mineral finds are sometimes kept secret.

Aircraft of the Hunting Survey Group, carrying electronic instruments and often based at temporary airstrips in the outback, are combing unexplored parts of the world at low level for hidden mineral deposits. A recent survey in the Philippine Islands has pinpointed a high-quality iron-ore deposit reckoned at 8,000,000 tons beneath jungle-covered terrain. Scientists believe that the area will become the Philippines' major mining centre, and the mining company's richest prospect.

Early in 1954 the Samar Mining Co. began prospecting in the Sibuguey area of Mindanao for iron ore deposits. The country here is dissected and jungle-covered, the worst possible terrain for ground parties, working "blind", to hack their way through, and such an operation would have been slow and exhausting. Hunting Geophysics Ltd. were, therefore, called in, and a Survey Prince aircraft equipped with airborne magnetometer covered the area in 22 days' flying.

The information picked up on the air unit's graph recorders enabled ground parties to go straight to the most promising spots, thus saving endless time and expense. Underground clearing, trenching and drilling have confirmed the airborne magnetometer's signals, and over 600 claims have been made along a front of 10 km.

The Samar Mining Co. wished to develop new iron resources in the jungle-covered western peninsular of Mindanao, the Philippines' largest island, and the first step was to find out where they should take their labouring gangs and drilling teams for the best results.

What was needed, therefore, was basic information on the geological structure of the area, and on the exact position within feet of worthwhile orebodies buried beneath the impenetrable vegetation. Hunting Geophysics Ltd. obtained this information for their client during the course of 22 days' flying. Based at Zamboanga airstrip, a Hunting Percival Survey Prince carrying a fixed-head magnetometer quartered the area in a series of flight-lines 400 m. apart, while the electronic equipment in the cabin console continuously recorded data which, when reduced to geophysical maps, enabled Samar to pinpoint all the workable deposits.

Samar then proceeded to verify those spots which the airborne gear had picked out. The company has 390 men and four diamond drill rigs working on the area, and hand-auger drills along with trench work were used to prove the deposits at a depth of 30 ft. A heavy diamond drill, capable of perforating 1,000 ft., has been ordered.

One area of mineralization may be taken as typical of the work being carried out in this terrain. An iron ore outcrop with a surface area of 22,100 sq. m., it gave rise to a strong signal in the airborne equipment as it was flown low overhead. Topographic mapping and 600 m. of 7-ft. trenching have now exposed the orebody at the surface in many sections, and 20 diamond drill holes to prove ore at depth have shown a deposit thickness of between 70 and 110 ft. in places. Topographic surveys, trenching and diamond drilling are being pushed ahead on other deposits and the whole tempo of exploration is rapidly increasing.

A recently completed airstrip is used by PAL Otter aircraft flying in supplies, and a foreshore lease has been applied for to establish a shipping site in the safe harbour of Dumanquilas Bay. A 40 k. railway line is also being surveyed to connect the harbour up with the mining area.

Altogether, the picture is extremely promising. Independent engineers and geologists beljeve that at least 8,000,000 tons of good high-grade ore are there for the taking, and the Sibuguey Project seems destined to become a huge iron mining centre of the Philippine Islands.

U.S. COAL OUPUT

The U.S National Coal Association has lowered its estimate of 1957 production to 516,000,000 s.tons from 532,000,000. This new figure is still 16,000,000 tons greater than output in 1956. The revision has been made after consideration of the output so far this year—currently running 5 per cent below that of the comparable period a year ago. This drop in output reflects the effect of floods and the East Coast dock strike, although coal dumping at Hampton Roads is 50 per cent up on last year. Export trade overseas is very brisk particularly to Western Europe. Total 1957 demand, including exports, is estimated at 52,100,000 tons, the 5,000,000 tons difference between demand and output being drawn from stocks. The Association estimates that most classes of industry will use more coal this year but cites railroads and steelworks as major exceptions.

So far this year, the U.S. soft coal industry has not lived up to the glowing expectations of 1957. Production and output is currently running some 6,000,000 tons below the level at this time last year.

Opposite are new rolling mills under construction at Jesenice, while below is shown an old-type iron works in Serbia

Developments in Yugoslavia's Steel Industry

BETWEEN the two world wars the development of Yugoslavia's steel industry was slow. Among the important installations then existing was a small iron works in Smederevo, a modernized iron works at Jesenice, an enlarged plant in Zenica, iron works at Ravne and Store, while immediately prior to the outbreak of war in 1939 a blast furnace was built at Sisak. Iron ore mines were also developed. Yet these activities were insufficient to allow the steel industry to play a major role in the Yugoslav economy.

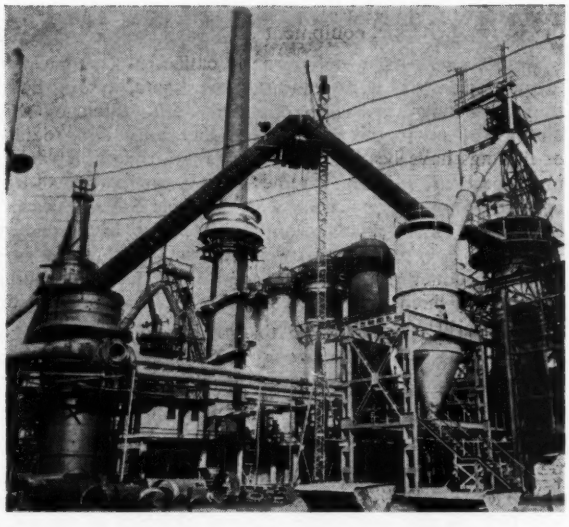
In 1939, for example, the country provided only 0.172 per cent of the world's steel production and 0.4 per cent of European output. The post-war reconstruction of Yugoslavia called in part for wide expansion in the steel industry, the success of this expansion being proven by the realization that in 1947 Yugoslav steel output already was greater than the tonnages recorded in the pre-war years.

A marked increase in production has been recorded in more recent years. During this period the iron works at Zenica, Jesenice, Ravne, Store, Sisak and Smederevo were enlarged and a new plant at Ilijas constructed. Further developments included the enlargement of the sheet rolling mill at Zemun, the establishment of a new wire rope and cable factory at Svetozarevo, together with the expansion of the Ljubia and Vares coal mines.

Below are high stoves at Sisak in Croatia, and opposite is a new picture of Zenica, the largest steel works in Yugoslavia

The largest proportion of those funds allocated to the development of the steel industry has been invested in establishing the Zenica plant. This plant is situated near coal and power supplies and is central in relation to the rest of the country. The recent expansion programme undertaken at Zenica was discussed in our issue of April 19, 1957.

It will be recalled that last year the Zenica works exported 120,000 tons of various iron and steel products. At the present, the coking plant with four batteries and an annual production capacity of 600,000 tons of coke has been completed as a part of the developments undertaken, and is operating at maximum output. The plant at Zenica for the production of gas by-products has also been completed and will provide 18,000 tons of tar, 4,300 tons of crude benzol and 4,300 tons of ammonium sulphate a year.

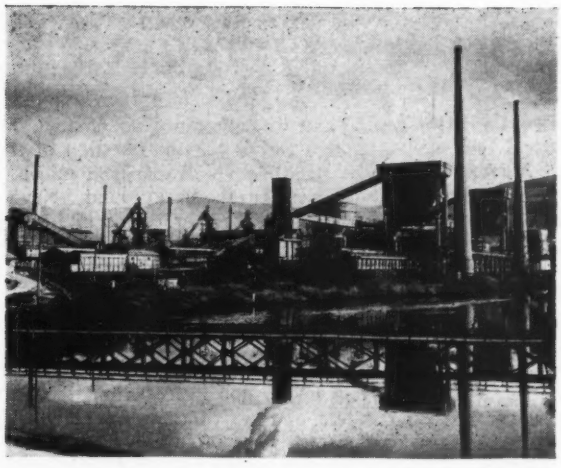


The rolling mill system at Zenica has an annual capacity of 200 tons, the blooming mills 75,000 tons, the wire rod mills 80,000 tons and the sections mill 130,000 tons. In all, the total capacity of the Zenica rolling mills is 550,000 tons.

The result of this national development programme for steel, of which Zenica was so outstanding an example, was that production showed a marked increase.

In 1955, iron ore output was approximately twice that of 1939. During that year, Yugoslavia produced five times more pig iron than in 1939, three times as much raw steel, fifteen times as much electro-steel and forty-five times as great a tonnage of rolled, drawn and wrought-iron products. In 1955, too, the nation's raw steel production totalled 0.3 per cent of the world total and 0.86 per cent of the total output of Europe. This production shows a 200 per cent increase over that of 1939.

It is interesting to note that since the Second World War, Yugoslavia's pig iron production has shown a greater percentage of increase than that of other producing countries of the world. Since 1939 world production has increased by some 98 per cent, and European production about 58



per cent not including the statistics of the Soviet Union. During the same period, Yugoslavia has increased pig iron output by approximately 242 per cent.

Moreover, this increased capacity has brought in its wake considerable changes of method that allow for a wide range of products. Since 1954 Yugoslavia has exported finished steel products. During 1956 exports of this commodity totalled 25,000 tons.

The new steel plants constructed before the end of last year, as well as the works at Niksic and Skoplje, are keeping abreast with the estimated requirements of the industry. These requirements are based on the tonnages assumed on estimated and proved iron ore deposits, reserves currently being estimated at 250,000,000 tons. A simple ratio between mine supply and plant demand ensures a century of pig iron production.

By Branko Djukic

Yugoslav steel production in 1957 will amount to more than 1,000,000 tons. While there is a shortage of some steel goods in the country and large quantities of rolled steel must still be imported, Yugoslavia's exports are nevertheless growing year by year.

The most important problems as yet unsolved are:

(a) Assuring a sufficiency of coal for coke production, as all efforts to meet the demand from indigenous supplies have failed;

(b) Ensuring full utilization of rolling mill capacity, as steel supply currently falls short of the tonnages that could be accommodated;

(c) Providing competent and trained staff;

(d) Erasing low productivity.

While productivity has increased in comparison with that of pre-war days, it remains a truth that Yugoslav output is low compared with that of the more industrialized countries. In 1956, some 2.23 tons of steel were produced in one month by each Yugoslav worker. In 1961, it is estimated that this output will rise to 3.18 tons. Even then, production *per capita* will still lag far behind the individual worker-output of the United States, the Soviet Union, the United Kingdom and Western Germany.

South Africa's Marginal Gold Mines

From our South African Correspondent

SUPERFICIALLY, in that there are no obvious developments, it might seem that the question of the future of the marginal or vulnerable gold mines is once more being pushed well into the background. Nevertheless, underneath the surface there are some interesting developments.

The Minister of Finance did say recently that the Mines Department had prepared something on the matter which would be placed before the Cabinet in due course. What the proposals are is anybody's guess. The general view here is that the two obvious possibilities of assistance can be ruled out. One is a higher gold price within the next few years when the fate of most of these mines will be settled. The second is some form of subsidy.

On the one hand, the South African Government has not the funds to pay subsidies and on the other, a scheme whereby a subsidy derived from earnings of richer mines is not only bad in principle, but would probably present almost insuperable difficulties.

The question thus remains as to whether the vulnerable mines can help themselves. Although not providing a complete solution, there have been some developments which could bear fruit. One is the request by the Mine Workers' Union to the Government to appoint an independent commission of inquiry into marginal mines which has now been agreed to by the Government. The immediate significance of this lies in the fact that it is probably the first move by the Union in its entire existence to take direct cognizance of the economic difficulties of the industry. Analyzing the implications of this move, one rather gets the impression that it falls within the scope of Sir Ernest Oppenheimer's famous phrase—"enlightened self-interest".

The position of European miners at the present time is that the acute shortage of mineworkers—and by this is meant the miner and men associated with mining as such and not artisans—which ruled in the post-war years has eased. This has been due to recruiting and the closing down or contraction of activities on a number of older mines. There are, in fact, signs that the gap between supply and demand is not too great at the present time.

From the Union's point of view, therefore, it is desirable to prolong the lives of the old mines as long as possible in order to, firstly, prevent unemployment coming about, and secondly, prevent as far as possible the disruption of the economic and social life of those employed on the Reef.

The key to the future of the marginal mines lies in costs. One obvious way to reduce them is by rationalization, dilution, readjustment or whatever you like to call it—in point of fact allowing Africans to carry out certain duties at present reserved for European miners.

One of the fundamental principles of the Mineworkers' Union is the preservation of the so-called Colour Bar within the industry. Officially it has not, and declares that it will not budge from its support of this principle. But, as can be seen, from the foregoing, it could be placed in a difficult position.

Should unemployment develop, then the mining industry could cut costs of the whole industry by reducing all wages. The decision which the Union may have to take is between the possibility of lower wages all round or sacrifice certain categories of work to Africans and preserve present wages levels for the majority of members.

Correlating this background with the request for an independent commission of inquiry, whose findings would be virtually binding on the industry, the deduction would seem to be that the inclination is towards the latter choice. It would be possible to make strenuous protests against a "Breach of the Colour Bar", should the commission recommend it, but it could be accepted.

The other development is the thoughts being expressed by technical men within the industry. They are beginning to ask whether a number of aspects of mining activity should not be radically revised—not only for marginal mines but for mining as a whole—in the light of the pressure of costs. These views—one might almost call them subversive—are popping up to an increasing degree in discussions among mining men. One particular aspect is of whether enough attention is being paid to costing.

A system of budgeting and cost control has been applied to one mine of the Central Rand with encouraging results. While the application of such a procedure will not in itself lower costs, it should enable a single-minded manager to take the action that will cut deadwood, whether it be in the form of labour, equipment or procedures.

A few mines have very recently called in a well-known firm of industrial consultants to investigate, among other things, costing *vis-à-vis* productivity and efficiency and also as an aid to the planning of operations. No details of findings have been published—nor are they likely to be in respect of individual mines—but your correspondent gathers from conversations with "people in the know", that there exists much room for changes in procedure which can only result in increased productivity, taking gold as the product and not tonnage—an aspect of mining operations which, unfortunately, is too often lost sight of.

There is a general feeling that this and other improvements on the technical side could best be collated and their worth assessed by an independent commission of inquiry as mooted by the Mineworkers' Union. One of the major functions of the Chamber of Mines is to speak for and on behalf of the mining industry on matters which affect it as a whole. This works excellently, as history has shown, on questions of labour and certain other aspects of mining activity. In this particular case, the problem of marginal mines does not affect the industry as a whole and the Chamber is faced with a difficult problem in arriving at a common policy. At one extreme, there are groups where the proportion of marginal to new mines is very small. Broadly speaking, it would be to their advantage to allow marginal mines to close and increase the output of young rich mines through the resources released—European and native labour in particular. At the other extreme, there is a group with no new mines, whose interest is to keep their present producers going as long as possible.

The position is complicated by the fact that there is no other existing body outside the Chamber which is competent to examine the position in detail. Such a body would have been useful as, according to South African practice, a Commission has the legal power to call for any evidence which it might consider germane to the issue. There is, however, a precedent: the Low Grade Ore Commission of 1930 which dealt with a similar situation, but whose findings were rendered redundant by the departure of South Africa from the Gold Standard. Yet, it was by no means unfruitful, for from it developed the formula tax and lease formula which, in spite of complaints about severity, are admitted to be models of equitable taxation.

Ghana's Gold Producers

By G. Keith Allen, B.M.E.

Reader in Mining Engineering, Royal School of Mines, Imperial College of Science and Technology

IN 1931, England went off the gold standard and the price of gold rose from 84s. 11½d. to 135s. per oz. leading to the second Gold Coast expansion. By 1941 there were 15 companies producing gold, and production reached 885,712 oz.—a figure not since equalled by the industry. Thereafter, as a result of the Second World War and the economic conditions that followed, a decline set in. By 1955, the gold producers were reduced to 10 in number and annual production to less than 800,000 oz. In 1955, the Marlu company exhausted its ore reserves and closed down; in 1956 Taquah and Abosso became unprofitable and was abandoned; and more recently the Lyndhurst property was acquired by Konongo Gold Mines; so that only seven gold-producing companies are in operation.

Exploration and Development

Besides the normal exploration and development of orebodies usually carried out by companies in the course of their mining operations, work on a broader scale was also undertaken. The Gold Coast Selection Trust (now Western Selection and Development Company) was formed in 1928 "to acquire, develop and float gold mining properties in West Africa" and in 1932/33 commenced active field work on concessions and options it had acquired for the purpose. It controlled practically the whole line of reefs between the Ariston mine in the south and Ashanti Goldfields. Activity was at its highest level in 1935 and 1936. Only one important discovery was made in this period, namely the oxidized surface deposits at Bogosu, to work which the Marlu Gold Mining Areas Company was formed in 1934.

There began at this time an era of shaft sinking and plant construction which reached a maximum just prior to the last war, and which, continuing at a much reduced rate since, could be said to have only just ended with the virtual completion of the Eaton Turner Shaft of Ashanti Goldfields Corporation.

In the following descriptions all tons are short tons.

Ariston Gold Mines (1929) Ltd.

At the Ariston mine, despite satisfactory development results, the rate of ore production had fallen from some 20,000 tons per month at the beginning of the First World War to only 6,000 - 7,000 tons in 1933/34. This decline was due mainly to the bad conditions of the then main shaft, Prestea Shaft, a compound shaft serving the mine to the 21st level. It was decided to build a new treatment plant with a capacity of 30,000 tons per month, and to replace the old shaft by a new vertical shaft, 3,100 ft. deep to the 24th level. This is the Central Shaft and it was the first of the modern shafts in the Gold Coast.

By 1939 the new treatment plant was operating, but, owing to the war and to the conditions that followed for several years, production did not reach the desired rate of 30,000 tons per month until about 1952. Nevertheless, development results continued to prove satisfactory and, after the war, it was decided to plan for an eventual output of 40,000 tons per month and to deepen the shaft to 4,000 ft. The necessary additions and modifications to the plant were completed and work in connection with the shaft deepening is in progress. Present output is close on 40,000 tons per month.

The greatest lateral development on any one level of the Gold Coast mines is at Ariston, where the 17th level has a total length of 22,580 ft.—over four miles.

Ghana Main Reef Ltd.

The development of the two main sections of this property, namely the Bondaye and Tuappim sections, was carried out from existing shafts, which were re-equipped for the purpose and deepened as required. A treatment plant was designed for a capacity of 8,000 to 10,000 tons per month and commenced operating in 1936. Current production is at the rate of about 11,000 tons per month. The lowest level being developed in the Bondaye section is the 20th level and in Tuappim the 17th level.

Ashanti Goldfields Corporation Ltd.

Here, prior to the last war, it was decided to explore the mine in depth from existing shafts before embarking on an expansion programme that would involve the sinking of a new main shaft from the surface. Progress was delayed by the war, but satisfactory evidence of the continuance of the orebodies being eventually obtained, the new 18 ft. dia. Eaton Turner Shaft was sunk and reached its final depth of 4,354 ft. in 1956. This is the deepest shaft in the country and, it is believed, in Africa outside the Union of South Africa.

The planned output was about 30,000 tons per month and a new plant to replace the existing one was finally completed and put into commission in 1949.

Run of mine ore approaches 1 oz. per ton and the mine is probably the richest in gold of any mine of comparable size in the world. Production is about 28,000 tons per month.

Bibiani (1927) Ltd.

In the early 1930's work at Bibiani was confined to geological study and further exploration of the orebodies from the existing shafts. The old No. 4 shaft was re-equipped and became the main hoisting way, known as Central Shaft.

Also in this period, in 1933, the erection of a pilot plant was completed to determine the best form of ore treatment, and following modifications this plant was capable eventually of a throughput of about 12,000 tons per month. It was superseded in May, 1939, by a new plant of a capacity of 1,000 tons per day.

Oxidized surface ore is also mined, and treated, at Bibiani, current output amounting to about 5,000 to 6,000 tons of surface ore and 24,000 to 25,000 tons of underground ore, making a total of 30,000 tons per month. The grade averages from 4.5 to 5 dwt. per ton.

Konongo Gold Mines Ltd.

At Konongo explorations and development of the several quartz reefs was conducted from existing shafts and notably from a new vertical shaft, the Odumasi Shaft, sunk prior to the last war to develop the important reef of that name. The shaft was circular, 15½ ft. in dia., and 2,000 ft. deep. It was the first major circular shaft of the Gold Coast.

It was decided initially to mill 6,000 tons per month, later increased to 10,000 tons, and a treatment plant of this capacity was erected and commenced operation in 1936. After the war, in 1949, ore from the adjacent Lyndhurst property (Lyndhurst Deep Levels (Gold and Silver) Ltd.), since acquired by the Konongo company, was also treated in the plant. Some five or six years ago the throughput was reduced to 5,000 tons per month, the grade of ore milled, however, being doubled at about 1 oz. per ton, largely owing to depletion of the lower grade reserves.

Marlu Gold Mining Areas Ltd.

This was primarily an opencast mine with, it was thought, possibilities of developing an underground section. The surface workings were laid out to produce 50,000 tons monthly, an "all slime" plant was built of this capacity and milling commenced in 1938. From February, 1942, until March, 1946, the mine was closed down under the Concentration Scheme mentioned later, and finally ceased operations in 1955, when the ore reserves were exhausted.

Underground exploration and development was unsuccessful in proving large sulphide ore reserves, and in the end only some 40,000 tons of this class of ore were treated in a small plant built for the purpose.

Amalgamated Banket Areas Ltd.

In 1936, when this company was formed, only the Abontiakon section was being worked, the ore being treated in an old stamp and tube mill at the rate of about 9,000 tons per month. The programme of expansion included extensive exploration and development of the property and the construction of a plant to treat eventually some 60,000 tons of ore per month.

To develop the Abbontiakon section, which was then served only by an incline main shaft, it was decided to sink a vertical shaft some 2,000 ft. deep, to intersect the reef at about the 18th level horizon, close to the synclinal axis of the banket series at this elevation. This was the Abbontiakon Vertical Shaft (A.V.S.) and sinking began in 1936.

Also at this time a new vertical shaft was started some 9,000 ft. to the south to open up the Mantrain section, payable reef here being indicated from diamond drilling from the surface and from early working to the west, and from the old Taquah mine on the eastern limb.

The shaft, the Mantrain Vertical Shaft (M.V.S.), was sunk 1,400 ft. and eventually was connected on the bottom level by a crosscut some 3,000 ft. long to the Taquah mine which had been unwatered. The M.V.S. intersected the reef a short distance above the 12th level on the western limb of the syncline, the bottom of which is here about 1,300 ft. below the surface.

Also in this period weathered banket reef close to the surface at Pepe was explored and eventually a large tonnage, amounting to some 3,000,000 tons averaging about 2.6 dwt. per ton, was proved and mined by opencast methods as referred to later.

The treatment plant was designed to treat 30,000 tons per month of this surface ore, and 30,000 tons per month of underground ore of 5 to 6 dwt. per ton in average grade. The new plant commenced milling in September, 1940, but all operations ceased temporarily in February, 1943, under the terms of the Concentration Scheme, which did not resume until 1946.

In 1949 the company acquired two adjacent properties, Gold Coast Banket Areas Ltd., and South Banket Areas Ltd., both of which had recently been working on a small scale, and connected them by ropeways to its reduction plant.

Last year the ore reserves at Pepe were mined out, and production is now at the rate of about 60,000 tons per month of underground ore, drawn from the sections mentioned above.

Taquah and Abosso Mines Ltd.

In the early 1930's the property was served by two incline shafts, the Abosso and Adjah Bippo Shafts. These had been sunk to the 13th level and connected by a reef drive at this elevation. Below this horizon the mine was being worked from an internal incline shaft in the Abosso section to the 20th level.

The milling rate was about 12,000 tons per month and it was decided to raise this to 20,000 tons, later increased to 30,000 tons per month, and to build a new plant for the purpose. The new plant started milling in 1936, and continued until the mine closed down in January, 1956.

Since the combined hoisting capacity of the two existing shafts in 1935 was inadequate for the higher rate of output that was desired, a new shaft, the Huni vertical shaft, was sunk at a point from where deeper development and mining could be advantageously carried out. The shaft was some 2,400 ft. deep and intersected the reef at about the elevation of the 26th level, the first main connection to the workings being a crosscut on the 23rd level.

When the mine closed down last year, milling was at the rate of approximately 28,000 tons per month.

Machinery and Equipment

Reconnaissance Electromagnetic System

Anomalies plotted on aero-EM maps may be mislocated, even when the best recovery techniques are used; by as much as 1,000 ft. Empirical correlation of anomalous zones may diverge widely from the geological possibilities as noted during ground investigation. Certain superficial features detected from the air may assume more prominence than do some important sulphide concentrations. The method used for rapid and exact location and appraisal of airborne EM conductors must therefore satisfy many needs. Experience has shown the absolute necessity of proving the cause and the precise location of AEM conductors prior to detailed geophysical and geological evaluation.

The reconnaissance system chosen must have range and discrimination similar to that of the airborne systems now in use, as its principal application is to locate precisely conductors indicated by aerial surveys. McPhar Geophysics Ltd. has developed a portable dual frequency unit which satisfies these requirements. The unit consists of a vertical coil transmitter, battery powered, weighing less than 15 lb. and an 8 lb. receiving system which measures distortion of the primary field. It can be used effectively with separations up to 600 ft.

This unit has the same discrimination against flat-lying conductors as has the standard McPhar unit. Such screening is particularly necessary in areas of variable or wet overburden. The two frequencies employed allow for an estimate to be made of the conductivity of the anomalies encountered. Such observations, when used with geological reasoning, often permit a reasonably accurate appraisal of the nature of the conductive body. Rapid reconnaissance surveys can be made, anomalous zones of interest checked as to degree of conductivity, and their strike and extent estimated.

A SIMPLE PINCER GRIP

The provision of temporary girders at right - angles to existing structures, capable of being easily moved forward or removed at short notice, is a problem which frequently occurs in tunnelling.

To meet this contingency, Follsain-Wycliffe Foundries Ltd. have produced the Wyclip, a simple pincer grip which may be easily secured in a few seconds. The unit consists of two sets of pincers, joined at their base by two parallel iron bars. A retaining bar is incorporated in the design to prevent undue force being exerted on the supporting girder due to the thrust of the suspended unit.

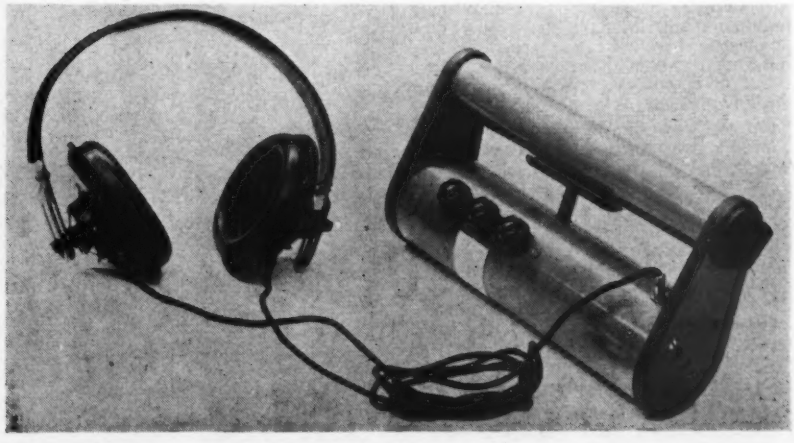
The Wyclip is becoming widely popular throughout the mining industry for use in forepoling work, a task for which it was originally designed. Due to the simple action of the pincer grip, the greater the load applied, the greater is the grip on the supporting girder, a feature of considerable importance where shock loads may be encountered.

The clips are available in seven sizes and are suitable for use on a wide range of girders from 4 in. x 2 in. to 8 in. x 6 in.

PORTABLE METAL DETECTOR

Metal Detection Ltd. now offer a portable lightweight detector incorporating transistors. The equipment comprises a hand unit and earphones, and enables hidden metals to be easily located.

The unit, only 4 lb. in weight, is passed over the surface or object suspected of metal, the oscillator volume increasing when metal is directly beneath the hand position. The apparatus is simple to operate, and can be used for detecting metal-reinforcing in concrete, metal in timber, hidden metal roof-supports in mines and other applications.



At top right is seen the portable dual-frequency unit used in the McPhar reconnaissance electromagnetic system. Below left, Follsain-Wycliffe Wyclips being used for forepoling in a steel arch-lined heading, and below right, the Transitect portable metal detector

HAULAGE SAFETY DEVICE

A simple safety device for use with slope drift balanced rope haulage systems is now in successful operation in five collieries in the West Fife area N.C.B. The device guards against failure of the facing points which are intended to ensure that a loaded train ascends the same track as the empty cars have descended. The points are automatically operated by the descending train of cars; if they fail the danger is that a descending train of empties will meet a load train on the same track.

To prevent this a warning system is installed, the essential feature of which is a 5/16 in. flexible steel wire located vertically between the two parallel tracks, 50 yards from the points. One end of this wire is anchored to the floor between the tracks; the other end is carried over pulleys in the roof to a weight which keeps it in tension. If the points fail, and the loaded train starts up the wrong track, the rope must automatically traverse across from the centre of the track which the train should mount to the centre of the wrong track; in so doing it fouls the safety wire tensioned vertically between the tracks.

As the safety wire is attached through a bell crank to the ringing key the the haulage is automatically rung off, the ringing key then being automatically locked in that position till the cause is investigated.

POPHOLING WITH SMALL DRILLS

The need for drilling small popholes in secondary rock fragmentation is one that is frequently encountered. A small lightweight drill is favoured for the operation in order to keep air consumption to a minimum and to make the best use of explosive used. Drilling speed is also important and in this regard the advantages of a miniature rock-drill has long been recognised.

A tool which meets this demand is the Consolidated Pneumatic 9, used widely for drilling short holes up to 8 in. deep. It has an overall length of 14¼ in. and weighs 7½ lb. Air consumption, at 80 p.s.i. is only 20 c.f.m.

The merits of using this minature drill are demonstrated in some figures recently made available on its use in a quarry near Kumasi, in Ghana. Here, an operator, with no previous experience of the tool, drilled 48 boulders in 53 minutes, using a 1 in. bit. Most of the boulders were drilled to a depth of 8 in. and in many cases, boulders measuring more than 6 ft. x 3 ft. x 3 ft. required two holes. Two pounds of 60 per cent gelatine dynamite were used for blasting and the yield of broken rock amounted to 36 tons. The rock is a tough, close grained, muscovite granite, typically representative of the older granite of the region.

BREAST BATTERY LIGHTING SET

A breast battery lighting set, which has been certified by the Ministry of Labour and National Service as intrinsically safe for use in inflammable atmospheres, is now available from The General Electric Co. Ltd.

It was developed in collaboration with a large petroleum company and although designed primarily for use in the oil industry where operations with explosion hazards have to be carried out at night, the lighting set has possible applications in mining.

The equipment consists of a miner's type lamp, which is connected by a flexible cable to a separate battery container, a webbing, body harness and a heavy gauge elastic harness which will fit over any normal headgear. The lamp is prefocused and is switched on and off by a rotation of the front cover. It can be worn in any position on the webbing body harness or alternatively on the elastic head harness.

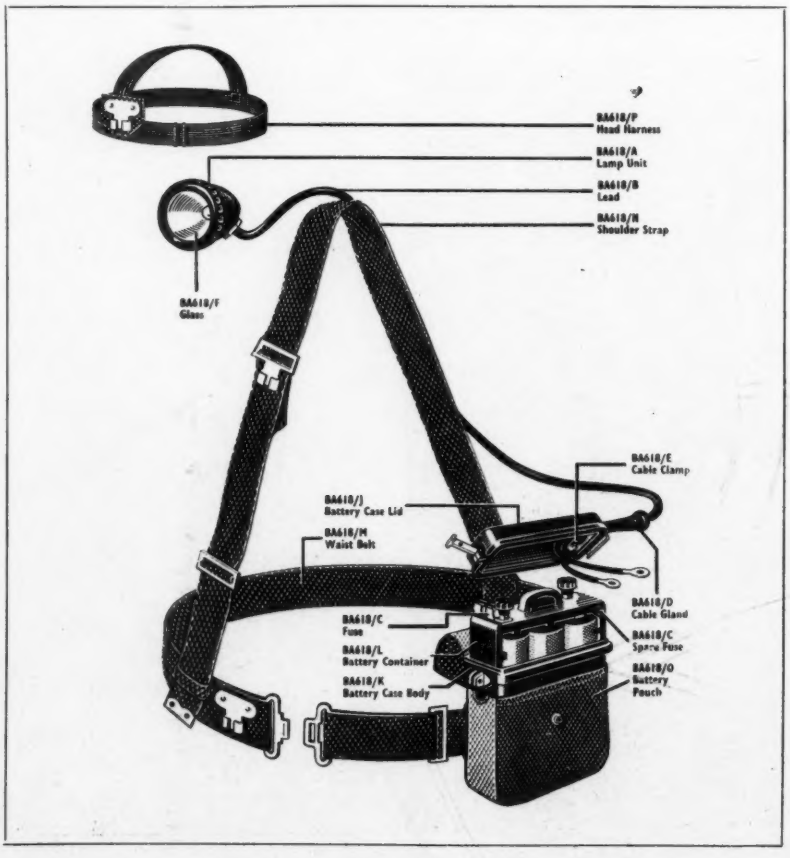
The battery container, which is of tough moulded Neoprene, is waterproof, impervious to oil or petroleum and is fire resistant. It is carried at the back on the harness waist belt. The lighting set is powered by three standard 1.5 volt unit cells and the total weight including batteries is just under 3¼ lb.

NEW METHOD OF COMMINUTION

The Gyradisc, manufactured by Nordberg Manufacturing Co., United States, is designed and built to produce large tonnages of fine product of metallic and non-metallic ores and minerals. Claimed as new and revolutionary, the method of comminution by Gyradisc, using the Gruender method of reduction, is a process of alternately impacting and releasing a thick mass of material. The fines are produced by the combination of impact and attrition of the multi-layer mass of particles as the mass moves progressively through the crushing chamber. The principle of reduction is therefore different from that employed in gyratory-type crushers.

The ideal feed for the Gyradisc is the open circuit product of a Symons Cone Crusher containing material minus 1 in., ½ in or ⅜ in., and fines. A close setting of the crushing members is not required to produce a large tonnage of fines. In fact, the percentage of fines increases when the discs are set relatively far apart.

To increase the tonnage and percentage of fines, the machine is set with an opening greater than the product requirements. As the material passes through the crushing cavity, which is composed of relatively flat crushing members, gradual reduction of the feed takes place to produce either fines or chips and fines depending upon the setting. The Gyradisc may operate in open circuit or in closed circuit with fines being separated by pneumatic or mechanical methods.



Above, use of the C.P. 9 drill in a quarry in Ghana and opposite, the G.E.C. breast battery lighting set

MINING MISCELLANY

Alcoa are said to be interested in setting up an aluminium smelter in the Bahia basin, Brazil, using power from the Paulo Alfonso hydro-electric plant.

★

During March the Demarara Bauxite Co. Ltd. shipped some 181,505 l.tons of bauxite in 43 vessels. The company's estimate of total shipments for the year is 2,000,000 tons.

★

Sweden will again buy 1,000,000 tons of coal from Poland, the same quantity as last year—as well as 200,000 tons of coke and 75,000 tons of fuel oil under a new trade agreement.

★

The Taijo Bussan Co., of Japan, are considering the development of nickel mines in Brazil. The deposits are reported to be situated some 50 miles from Santos and the reserve is estimated to be about 250,000 tons.

★

Production at Geco Mines, one of Canada's new copper mines, is expected to start early in August. The estimated cost of bringing the property to production with the provision of adequate stores and working capital has been $23,700,000.

★

Brannerite, an ore of uranium, has been found about 50 miles from the Radium Hill uranium mine in South Australia. A shaft has been sunk in the area and deeper drilling will now be carried out to prove ore reserves at greater depth.

★

Three Japanese steel producers have signed an agreement with the Samar Mining Co. (Philippines) to provide $300,000 in prospecting work at the Sibuguey iron ore deposits, which are estimated to contain 10,000,000 tons of ore, reported to average 60 per cent Fe content.

★

Aerial prospecting for diamonds is being carried on over the Yakut Taiga in the U.S.S.R. The planes are equipped with a special instrument which records the size of the magnetic field. This method of prospecting, it is claimed, was developed by Leningrad scientists.

★

Ontario's 30 gold mines produced 623,459 oz. of gold and 101,068 oz. of silver, with a combined value of $20,999,964, in the first three months of 1957. The leading gold producer, Kerr Addison, achieved a production valued at $4,300,000 in the first quarter, followed by Hollinger with $2,300,000 and McIntyre with $1,900,000.

★

Hungarian coal production has been restored to the average of the first months of last year, following a severe decline after the events of last October. In the first ten days of April output averaged 67,396 tons a day, with a peak on April 3 of 78,000 tons. The labour force, which fell to 40,000 after October, has been built up to 90,000.

★

Caterpillar's new plant in Melbourne, Australia is "progressing well", reports the company's chairman of the board, Mr. Louis B. Neumiller, following a two-month tour of Australia and other Pacific areas along with the executive vice-president, Mr. William Blackie. The long-term business outlook in Australia is regarded as particularly impressive.

★

According to Press reports, a West German physicist who accompanied the West German Minister of Defence on his visit to Turkey announced that his government had asked the Turkish Government for permission to search for uranium. He was convinced that there were extensive uranium deposits in Turkey.

More than 100,000,000 tons of coal were produced in the U.S.S.R. in the first quarter of this year—almost 10,000,000 tons more than in the corresponding period of 1955. This progress is ascribed mainly to mechanization of labour. Some 2,700 coal combines are now in use. In addition, more than 300 cutters, hundreds of scraper and belt conveyors, electric locomotives and other machines have been delivered to mines this year. One hundred per cent mechanization has been introduced in many pits and open cast workings. In 1960 coal production in the U.S.S.R. is scheduled to reach some 600,000,000 tons, compared with 429,000,000 tons in 1956.

On the occasion of his 77th birthday last Wednesday, Sir Ernest Oppenheimer performed the opening ceremony at the new offices of the Diamond Trading Company at No. 2 Charterhouse Street, London, E.C.1. This fine new building brings under one roof the London Offices both of the De Beers organization and the Anglo American Corporation of South Africa. Our photograph shows Sir Ernest shaking hands with Mr. Philip Oppenheimer under the commemorative clock which he unveiled at the ceremony

The 9th International Liege Fair, opened by the Belgian Minister of Labour, M. L. E. Troclet on Saturday, April 27, and continued until Sunday, May 12, 1957, was visited by just over 250,000 people, including many foreign trade buyers. Of the 450 exhibitors in this purely technical fair, which took as its theme "Applied Science in Industry" and featured only four main subjects:—Mining, Metallurgy, Mechanical and Electrical Engineering, only 25 were British. Their products comprised mainly miners' helmets and safety lamps, electrical and hand tools, paint spraying equipment, electrodes for welding, cement mixers, conveyor belts, small petrol motors and pumps.

★

The British Industries Fair closed with buyers from 108 countries having visited it—a greater number than had been covered by advance publicity. The last day was unusually outstanding for orders. In particular, there was a cable from a St. Louis (Missouri) company placing the biggest dollar order received at the Fair—for £32,000 worth of tools that "fire" bolts into masonry, made by Explosive Power Tools.

★

It was suggested recently in New York that abandoned old mines, particularly deep level workings, should be used as depositories for the safe dumping of radio-active wastes. These wastes will naturally increase in volume as the nuclear industries advance. A group of scientists recently tended to register opposition to the disposal of atomic wastes in the sea. It is understood that one company operates a ship to dump special carboys of atomic wastes in the Atlantic. Indications are that the company may soon place in operation another vessel.

★

The Montana Silver Lead N.L. special prospecting licence in Tasmania has been extended for a further period. General prospecting continues in the nickel-copper area.

The first four out of 13 heavy diesel locomotives ordered by Egypt have left the Henschel works at Kassel, Western Germany, for Alexandria. The streamlined engines are nearly 24 metres long and weigh 132 tons each. They are to be used for ore trains in the Nile Valley.

★

Aeromagnetic Surveys Ltd., of Toronto, has been selected to receive a Blue Ribbon Mining Award by a panel of American mining, metallurgical and contracting experts. The award was made for "achievement in equipment development aiding the technological advancement of the mining industry". This year's award went to A.S.L.'s helicopter-borne electro-magnetic detection system contained in a "bird" towed under a helicopter. A similar award last year went to the company's development of an airborne electromagnetic survey device carried in a fixed wing aircraft.

★

Dallow Lambert & Co. Ltd., have opened, at Thurmaston, Leicester, one of the most modern factories in the U.K. exclusively devoted to the manufacture of dust-control equipment. Based upon a site of ten acres the first stage of the project has been completed with a building floor space of 56,000 sq. ft.

PERSONAL

The Rt. Hon. Lord Ismay has joined the boards of Bibiani (1927) Ltd. and Ashanti Goldfields Corporation Ltd.

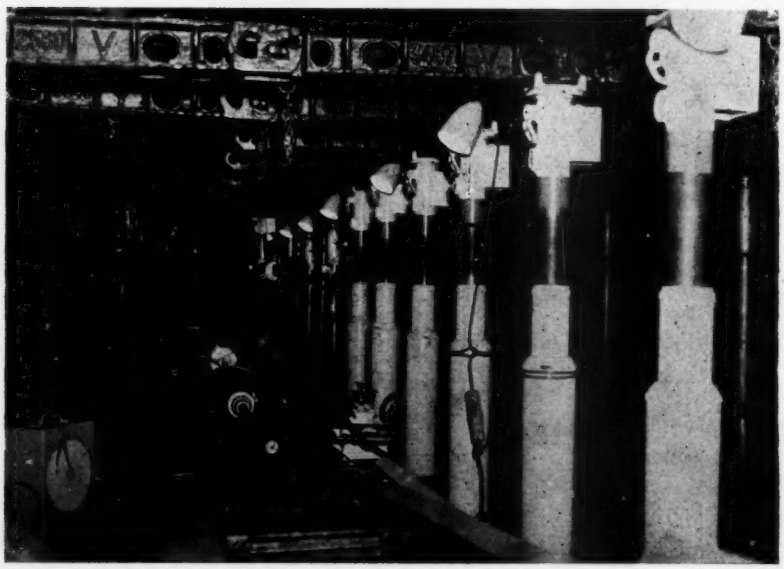
★

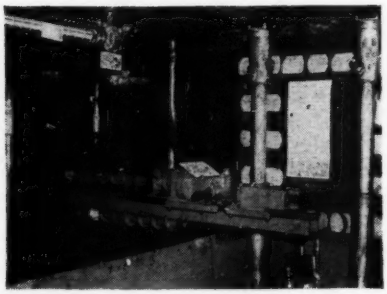
Mr. Jack Thomson, who is to relinquish the appointment of general manager of Roan Antelope Copper Mines on July 31, has been appointed head of the Rhodesian Department of Selection Trust in London. He will take up his new appointment later this year. Mr. N. M. Kenny has been appointed general manager of Roan Antelope Copper Mines with effect from August 1.

★

Mr. H. R. Marshall has resigned from the board of Nigel Van Ryn Reefs Ltd.

Only 25 British manufacturers exhibited at the 9th International Liege Fair, which ended on May 12, 1957. One such company was Dowty, and the picture below shows their steel telescopic pit props on the Belgian Coal Industry stand. Above is German cutting equipment on the same stand





Mr. A. J. Sumption, Mr. R. M. S. George and Mr. G. R. R. Brown have been appointed directors of Rukuba Tin Mines Ltd. Mr. G. McCorbett, Mr. R. Manners-Clarke and Mr. G. J. Staveley have resigned from the board.

★

Mr. William T. M. Browne has been co-opted a director of Naraguta Tin Mines. Mr. E. A. P. Levett Scrivener has resigned from the board.

★

Mr. W. H. Bowman has resigned from the Board of T.I. Aluminium.

CONTRACTS AND TENDERS

The I.C.A. has announced the following future authorizations:

South Africa

Flat copper busbar. Five items from 300 lb. to 3,000 lb. Various sizes. Closing date, June 19, 1957. Ref.: E.S.B. 12697/57. Telephone Chancery 4411, extension 738 or 771.

South Africa

Two motor-driven pumping sets for surface work. Closing date June 3, 1957. Ref.: E.S.B. 12693/57. Telephone Chancery 4411, extension 738 or 771.

Korea

Various quantities and types of dynamite; drill steel; wire rope; fuse; steel plate, angle, etc.; blasting caps; stress - roted timber. Closing date, June 5, 1957. Ref.: E.S.B. 11815/57. Telephone Chancery 4411, extension 360.

Israel

Iron and Steel Mill materials, steel mill products and ferro-alloys. Contract period, April 29, 1957—October 31, 1957. Terminal delivery date April 30, 1958. Amount $U.S.2,250,000. Ref.: E.S.B. 12582/57. Telephone Chancery 4411, extension 360.

Cambodia

Construction, mining and conveying equipment. Contract period 25/4/57 to 31/10/57. Terminal delivery date 30/4/58. Amount $U.S.100,000. Ref.: E.S.B. 12582/57. Telephone Chancery 4411, extension 360.

Iran

Iron and steel mill materials, steel mill products and ferro-alloys. Not ferrous scrap. Contract period 29/4/57 to 31/10/57. Terminal delivery date 30/4/58. Amounts $U.S.1,815,000 and $U.S.585,000. Ref.: E.S.B. 12582/57. Telephone Chancery 4411, extension 360.

Turkey

Construction, mining and conveying equipment. Ref.: E.S.B. 12582/57. Telephone Chancery 4411, extension 360.

Iron and steel mill materials, steel mill products and ferro-alloys. Ref.: E.S.B. 12582/57. Telephone Chancery 4411, extension 360.

Metals and Minerals

Brazil To Export Manganese

Brazil is about to start exporting manganese from mines discovered in the Amapa Territory in 1946. These mines, with reserves of over 40,000,000 tons, are exploited by Industria e Commercio de Minerios (ICOMI), of Belo Horizonte, in association with Bethlehem Steel Corporation. According to the concession minimum stocks of 400,000 tons must be retained in Brazil. Subject to this provision the American partner, which holds 49 per cent of the shares, is entitled to export 30 per cent of the output, which will be in the region of 600,000 tons annually. Owing to the entire absence of transport facilities in this remote region the concessionaires had to build a port at Santana, near Macapa, and connect it to the mines by a railway, 140 miles long. The work has been completed at a cost of U.S.$75,000,000, including mining equipment.

Brazil will also start exporting manganese from the Urucum mines near Corumba, in Mato Grosso, as soon as negotiations are concluded between the concessionaires, the Chamma brothers, and United States Steel Corporation. The Urucum reserves are estimated at 33,670,000 tons, with an average content of 45.6 per cent Mn. and 11.1 per cent Fe.

U.S. Steel holds a concession to exploit the manganese deposits at Lafaiete, Minas Gerais, but these are now reduced to some 2,000,000 tons and will henceforth be reserved for home consumption. In exchange for its rights the American company has been authorized to participate in exploiting the Urucum deposits. Owing to the lack of adequate rail communications, the ore must for the present be shipped in lighters over the Paraguay River, 11.4 miles distant from the mines, to Rosario, in Argentina, and transferred there to ocean-going steamers.

U.S. BARTER DEALS SUSPENDED

Pending the outcome of a policy review of barter operations which is now in progress the U.S. Commodity Credit Corporation suspended barter transactions since April 30, last. However, during the first quarter of the current year the U.S. Department of Agriculture has reported that barter contracts have been negotiated, valued at a total of $104,722,000. This figure compared with an aggregate of $155,099,000 for the first quarter of 1956 and with $315,800,000 for the whole of last year.

At March 31, 1957, the strategic materials acquired through barter and held in the Commodity Credit Corporation inventory pending transfers to the stockpile with reimbursement to the CCC were valued at $310,366,000. Of this amount, materials valued at $135,121,000 are to be transferred to the national stockpile and the remainder, valued at $175,245,000, is to go to the supplemental stockpile.

Types and values of supplemental stockpile, strategic materials in the CCC inventory at March 31, 1957, were as follows:

Strategic Materials	*$ U.S. (000)*
Lead	20,755
Zinc	39,789
Crude Aluminium oxide	4,593
Antimony Metal	1,297
Bismuth	877
Cadmium	7,134
Industrial Diamonds	26,298
Ferro-chromium-silicon	5,084
Ferro-manganese	57,527
Fluorspar	6,432
Manganese ore	389
Palladium	3,636
Rare earths	1,405

RECORD NICKEL PRODUCTION IN 1956

For the sixth consecutive year world mine production of nickel established a new high level. In 1956 output reached 231,000 s.tons which represents an increase of about 7 per cent over the 1955 figure of 215,000 s.tons. According to

LONDON METAL AND ORE PRICES, MAY 23, 1957

THE WEEK ON THE L.M.E.

	May 16 Buyers	May 16 Sellers	May 23 Buyers	May 23 Sellers
COPPER				
Cash	£236½	£237½	£239½	£239½
Three months	£236	£236½	£240	£240½
Settlement		£237½		£239½
Week's turnover		6,550 tons		9,600 tons
LEAD				
Current ½ month	£95½	£95¾	£98½	£99
Three months	£95¼	£96	£98¼	£98¾
Week's turnover		7,300 tons		2,750 tons
TIN				
Cash	£765	£766	£764½	£765
Three months	£761	£761½	£762½	£763
Settlement		£766		£765
Week's turnover		1,240 tons		615 tons
ZINC				
Current ½ month	£83¼	£83¾	£85¼	£86
Three months	£79½	£80	£82¼	£82¾
Week's turnover		7,475 tons		6,650 tons

METAL PRICES

Aluminium, 99.5%, £197 per ton

Antimony —
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) basis 25s. 8d./24s. 6d. nom. per unit

Arsenic £400 per ton

Bismuth (min. 1 ton lots) 16s. lb. nom.

Cadmium 12s. 0d. lb.

Cerium (99% nett), £13 18s. lb. delivered U.K.

Chromium, Cr. 99%, 4s. 2d. lb.

Cobalt, 16s.-19s. lb.

ORES AND OXIDES

Bismuth	65% 8s. 6d. lb. c.i.f. 18-20% 1s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semifriable) 48%	£17 8s. 0d. per ton c.i.f.
" Hard Lumpy (45%)	£17 8s. 0d. per ton c.i.f.
" Refractory 40%	£12 15s. 0d. per ton c.i.f
" Smalls 42%	£16 5s. 0d. per ton c.i.f.
Baluchistan	£18 15s. 0d. per ton c.i.f.
Columbite, 65% combined oxides, high grade	185s./197s. 6d. per unit
Fluorspar—	
Acid Grade, Flotated Material	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% $Ca F_2$)	156s. 0d. ex. works
Lithium Ore—	
Petalite min. 3½% Li_2O	£8-£10 per ton f.o.b. Beira
Lepidolite min. 3½% Li_2O	£8-£10 per ton f.o.b. Beira
Amblygonite basis 7% Li_2O	£28-£32 per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite Raw (ground)	£21 0s./£22 0s. d/d
Molybdenite (85% basis)	8s. 5d. nom. per lb. (f.o.b.)
Titanium Ore —	
Rutile 95/97% TiO_2	£61/£63 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO_2	£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	150s./155s. per unit c.i.f.
Manganese Ore Indian	
Europe (46%-48%) basis 140s. freight plus 10% surcharge	136d nom. per unit c.i.f.
Manganese Ore (43%-45%)	106d. nom. per unit. c.i.f.
Manganese Ore (38%-40%)	100d. nom. per unit. (including duty)
Vanadium —	
Fused oxide 90-95% V_2O_5	£12½-£13½ per unit c.i.f.
Zircon Sand (Australian) (65-66% ZrO_2)	£20 per ton c.i.f.

Germanium, 99.99%, Ge. kilo lots 3s. 4d. per gram

Gold, 250s. 4½d.

Iridium, 127/129 oz. nom.

Kanthanum (98/99%) 15s. per gram

Manganese Metal (96%-98%) £310

Magnesium, 2s. 5½d. lb.

Nickel, 99.5% (home trade) £600 per ton

Osmium, £20/22 oz. nom.

Osmiridium, nom.

Palladium, £8 0s./£8 10s. oz.

Platinum U.K. and Empire Refined £33/£33½ oz.
Imported £33/£33½ nom.

Quicksilver, £91 ex-warehouse

Rhodium, £42 oz.

Ruthenium, £15/£17 oz. nom.

Selenium, 85s. nom. per lb.

Silver, 79½d. f. oz. spot and 79d. f'd.

Tellurium, 15s./16s. lb.

the U.S. Bureau of Mines, Canada produced 178,767 tons or about 77 per cent of the total. New Caledonia (French) was the second largest producer with 25,500 tons and Cuba third with an output of 16,062 tons. The United States produced 623 tons as a by-product of copper refining and a further 6,100 tons were recovered from refining other ores.

Perhaps the feature of the statistical position was that in spite of the diversion to industry of 77,500,000 lb. from scheduled shipments to the U.S. Governments's stockpile, nickel shortage for civilian needs continued.

Consumption of nickel in 1956 was 127,578 s.tons compared with 110,100 s.tons in 1955. Stainless and engineering alloy steels absorbed nearly 40 per cent of the total production. The use of nickel in stainless steel was 24 per cent greater than in 1955 but that for engineering alloy steel was 8 per cent smaller. More nickel was also used in cast-irons, high temperature and electrical resistance alloys, non-ferrous alloys, electro-plating, catalysts, ceramics, and magnets.

JAPANESE ILMENITE IMPORTS

Ishihara Sangyo Kaisha, the sole Japanese producer of titanium dioxide, has contracted to import 15,000 tons of titanium slag from Canada for shipment up to November this year. Ishihara stated that Japan's needs of ilmenite totalled about 100,000 tons annually at present, and were covered by imports from Malaya, Australia and India. The firm added that Ceylon, which planned to develop her resources, would become a good supplier of ilmenite to Japan in the near future. Ishihara is negotiating for purchases of Ceylonese ilmenite, the quality of which is stated to be excellent.

U.S. ANTIMONY SUPPLY DECLINES

The U.S. "new supply" of primary antimony in 1956 was about 14,600 s.tons —a 7 per cent decrease from the 1955 supply of 15,700 tons, according to the Bureau of Mines, U.S. Department of the Interior. Of the total available, domestic mine production accounted for 4 per cent, antimony recovered by primary lead refineries 10 per cent, and imports 86 per cent. Domestic mine production of antimony in 1956 was 590 s.tons, compared with 633 tons in 1955, while general imports of contained antimony totalled 12,500 tons. Imports of ore and concentrate—principally from Mexico, Union of South Africa and Bolivia—decreased 12 per cent from the previous year; the average grade was 38 per cent antimony or 8 per cent lower than in 1955. Imports of metal—chiefly from the U.K. and Yugoslavia — increased 28 per cent. U.S. smelter production of primary antimony was 10,000 tons, or 22 per cent above output in 1955.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

A rather better tone has developed on the London Metal Exchange during the past week with the result that quotations generally show some advance compared to those ruling at the end of last week. Turnovers have on the whole been maintained at the recent satisfactory levels, with the exception possibly that in the case of lead there would appear to have been a return to the quiet conditions which in the past have been a feature of this market.

UNCERTAIN COPPER MARKET

At the end of last week and, indeed, when dealings were resumed after the weekend, copper values continued to drift lower but on Tuesday the decline was halted by the buying of a considerable tonnage of forward metal from two influential quarters. Whether this will be maintained or not is difficult to say but the general feeling has been, as we have mentioned before, that after such a steady fall in price a technical rally was due. But it must be remembered that with the approach of the holiday season the market is entering a traditionally quiet period.

At the same time it will be noted that the backwardation has once again given way to a small contango following the increase of 1,675 tons in the stocks of metal in U.K. official warehouses at the end of last week. This increase was mainly in London where stocks now stand at 5,000 tons. On Monday there was a one-day strike at the Bancroft Mine in Northern Rhodesia by 300 of the daily paid European workers who protested at the inadequate hospital facilities provided for them.

★

In the U.S. the producers still stick rigidly to their 32 c. quotation which is 2 c. above the customs smelters and 2½ c. over the U.S. export market of about 29½ c. Although it is realized how reluctant the primary producers are to make any price concession it is difficult to see how much a spread can be maintained and it is felt that pressure for a price cut is increasing. In fact, one source has even gone so far as to indicate June 1 as a likely date.

The U.S. scrap copper market was softer as a result of lack of buying interest, with the basic price down to 24¼ c.

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The Copper Institute reported during the week that production in the U.S. of crude copper for the month of April was 110,016 tons (March: 106,718 tons); refined copper was 144,013 tons in April (March: 143,961 tons). Stocks, however, showed a decline, being at the end of April 139,842 tons as against 140,191 tons in March.

★

From Chile there are reports that the optimism evident early in the year that the copper price would be maintained had given way to the belief that the Government faces the possibilitity of certain difficulties. At the end of March, however, concern generally as to a further price decline had diminished and it was hoped that the market had reached its lowest point.

NO CHANGE IN TIN

The tin market has undergone no radical change, with buying interest reported on the quiet side although in some quarters the opinion is held that prices could now be near the floor bearing in mind the present price in Singapore and the possibility of purchases by the Buffer Stock. Although stocks in official warehouses at the end. of last week only increased 12 tons and now stand at the comparatively satisfactory figure of 1,552 tons, the small backwardation has been maintained which can be interpreted to mean that some of this metal may now be held by the Buffer Stock.

Malayan tin in ore production during April was 4,963 tons compared with 5,600 tons for the month of March. On Thursday morning the Eastern price was equivalent to £782 per ton c.i.f. Europe.

STOCKPILING CONTROLS LEAD-ZINC PRICES

A further ½ c. reduction in the U.S. lead price was made on May 16 but apart from this the lead and zinc markets generally have been dependent almost entirely on the news from Washington as to the U.S. Government stockpiling intentions. Thus the announcement by the U.S. Defence Mobiliser to the effect that the U.S. Government would increase its domestic purchases of lead and zinc for the strategic stockpile in June and by the U.S. Department of Agriculture that it was hoped that a curtailed barter programme would be resumed in about a week by excluding some countries and some farm commodities, served to firm up prices for both metals.

At the same time, as far as the strategic stockpile is concerned it was pointed out that June purchases would be bigger than in recent months but not as big as in past periods to permit the Government to take advantage of the lower price now ruling. It is not known whether the dollar value of the purchases will be increased or whether the authorities will obtain more metal at the lower price for the same amount. It has been estimated by people in the industry that stockpile purchases of domestic lead have recently been at the rate of only about 3,000/4,000 tons per month and of domestic zinc at 5,000 tons or more per month.

Lead consumption here continues at a fairly satisfactory level and in the first quarter of this year the cable industry took more metal than in the same period last year. The U.S. Bureau of Mines reports mine production of lead in the U.S. in March at 30,400 tons or 4 per cent more than in February.

Consumers have, generally speaking, been reserved in covering their requirements of zinc and tend to purchase only their minimum requirements. The narrowing in the backwardation from the recent high rate has been a welcome feature although it is by no means certain that the spread between the cash and forward quotations will not widen again. The U.S. Bureau of Mines report mine production in the U.S. of zinc at 50,200 tons in March or 9 per cent more than February and the largest since April, 1953.

Closing prices and turnovers are given in the table on page 663.

Mining Finance

Triumph for the Group System

For a considerable time the future of Central Mining and Investment Corporation has been a matter of wide speculation. The shares of the Corporation came into prominence last year with the announcement that a merger with Consolidated Gold Fields was being negotiated. The subsequent announcement that talks in connection with the merger had reached no conclusion and that the amalgamation would not go through seemed to be the starting point of a fresh and sustained period of buying Central Mining Ordinary shares. Until this week rumours have been accumulating that a fresh bid for the control of the company was to be made and in this connection the names of various South African, American and London groups have been bandied about. The net result, marketwise, was that from a low point of only 35s. at one time last year the shares have steadily climbed in recent weeks to as high as 75s., the figure which had been commonly accepted in many quarters as the one at which a bid was likely to be made.

This week there has been an announcement which dashed these rumours and forecasts to the ground. The announcement, made on behalf of a number of powerful interests, says a group now holds approximately 80 per cent of the £1,000,000 5 per cent Cumulative Preference shares in Central Mining. A new South African company is to be formed to take over the holding from the group which consists of Mr. C. W. Engelhard and Mr. Gordon Richdale, of New York, the Anglo American Corporation of South Africa, Union Corporation and a group of bankers comprising Messrs. N. M. Rothschild and Sons, J. Henry Schroeder and Robert Benson Lonsdale and Co.

This new company will also acquire from the group a "substantial" holding of Central Mining Ordinary shares. These holdings have been acquired from institutional investors with the knowledge of Central Mining itself. The new company will be formed with a share and loan capital of £5,000,000 and the majority of shareholders will be British and South African. The Central Mining-Rand Mines group will itself be offered a participation in the new company the objects of which will be to assist in the expansion of the Central Mining group with a view to developing its mining and other activities not only in South Africa but in other parts of the world.

Meanwhile, new voting rights for the Ordinary and Preference shareholders are to be considered at an extraordinary meeting of Central Mining next week. These new proposals, which will appreciably reduce the Preference vote in relation to the total, will not be opposed by the new group, which is offering to purchase the remaining Preference shares at 24s. per share net. This is the price at which the 80 per cent of the Preference capital has been acquired.

The degree of control in Central Mining which the new group will have is a matter of speculation depending on the size of the Ordinary shareholding. It is a fair assumption, however, that the stake held is sufficiently large to be a deterrent to any other interests who were thinking of an attempt to gain control. Since no bid for the Ordinary shares now seems likely, it is difficult to see how the price of the shares can keep up at anything like their recent level.

LONDON STOCK EXCHANGE PRICES, MAY 22, 1957

Finance	Price May 22	+ or — on week
African & European	52/6	+1/3
Anglo American Corpn.	5¼	+1/16
Anglo-French	22/3	+3d
Anglo-Transvaal Cons.	27/6	+1/3
Central Mining (£1 shrs)	66/10½	—5/7½
Consolidated G'fields	52/6	.....
Consol. Mines Selection	30/-	+9d
East Rand Consols	1/6	—1½d
General Mining	51/3	—1/3
H. E. Prop.	8/-	.....
Johnnies	41/-	+3/-
Rand Mines	71/3	.....
Rand Selection	32/6	—7½d
Union Corporation	37/3	+3/3
Vereeniging Estates	4¾	.....
Writs	34/6	+3d
West Wits.	30/-	—3d
Rand Gold		
Blyvoors	19/-	+3d
Brakpan	4/10½	+1½d
Buffelsfontein	29/9	—1/1½
City Deep	11/7½	+1½d
Consol. Main Reef	12/9	+6d
Crown	23/-	+2/6
Daggas	29/4½	+1/-
Dominion Reefs	16/9	+6d
Doornfontein	19/9	—6d
Durban Deep	21/3	+1/3
E. Champs	2/6	—1½d
E. Dagsas	7/3	+4½d
E. Geduld (4s. units)	26/-	.....
E. Rand Props.	37/6	.....
Geduld	66/3	—1/3
Govt. Areas	3/6	—1½d
Grootvlei	14/4½	—3d
Hartebeestfontein	46/1½	—3d
Libanon	6/-	—1½d
Luipaards Vlei	13/-	.....
Marievale	17/4½	—3d
New Kleinfontein	3/-	.....
New Pioneer	17/3	—3d
Randfontein	29/9	+10½d
Robinson Deep	7/-	+1½d
Rose Deep	8/6	.....
Simmer & Jack	3/7½	—1½d
S.A. Lands	23/-	+9d
Springs	2/-	+1½d
Stilfontein	25/6	.....
Sub Nigel	18/-	+1/4½
Vaal Reefs	30/3	.....
Van Dyk	3/-	+1½d
Venterspost	11/9	—3d
Vlakfontein	13/9	.....
Vogelstruisbult	12/3	.....
West Driefontein	4 1/16	—1/16

Rand Gold contd.	Price May 22	+ or — on week
W. Rand Consolidated	29/6	+6d
Western Reefs	27/1½	.....
O.F.S. Gold		
Freddies	5/-	+3d
Freddies Consolidated	3/6	+3d
F.S. Geduld	58/9	—7½d
Geoffries	2/7½	.....
Harmony	18/6	—6d
Loraine	4/-	.....
Lydenburg Estates	11/3	+9d
Merriespruit	3/10½	—1½d
Midole Wits	8/9	+4½d
Ofsits	48/-	+1/9
President Brand	46/-	—6d
President Steyn	24/3	—9d
St. Helena	21/9	+1½d
Virginia Ord.	10/-	.....
Welkom	14/9	+1/6
Western Holdings	60/-	+7½d
West African Gold		
Amalgamated Banket	1/-	—¾d
Ariston	3/10½	—1½d
Ashanti	20/6	—10½d
Bibiani	2/7½	—1½d
Bremang	1/3	.....
Ghana M.R.	1/10½	+3d
Konongo	1/6	+1½d
Marlu	½d	.....
Taquah	1/3	+1½d
Western Selection	5/3	—1½d
Australian Gold		
Gold Mines of Kalgoorlie	12/6	+3d
Great Boulder Prop.	12/1½	—1½d
Lake View & Star	19/9	+7½d
Mount Morgan	13/-	.....
North Kalgurli	7/6	.....
Sons of Gwalia	1/9	.....
Western Mining	8/9	—4½d
Miscellaneous Gold		
Cam & Motor	7/9	.....
Champion Reef	6d	.....
Falcon Mines	7/10½	+1½d
Globe & Phoenix	24/6	—3d
Motapa	10½d	.....
Mysore	3d	.....
Nundydroog	6d	.....
St. John d'el Rey	51/3	—2/9
Zams	56/10½	+1/3

Diamonds and Platinum	Price May 22	+ or — on week
Anglo American Inv.	8 7/16	+5/16
Casts.	28/-	—1/1½
Cons. Diam. Pref. of S.W.A.	10/9	.....
De Beers Defd. Regd.	4 25/32	—1/32
De Beers Pfd. Regd.	13¼	—¼
Pots. Platinum	14/9	—3d
Waterval	25/7½	.....
Copper		
Bancroft	37/9	—1/4½
Chartered	74/-	+1/3
Esperanza	2/3	—1½d
Magundi	8/9	+3d
Messina	8 1/16	+1/16
Nchanga	11 3/4	—¼
Rhod. Anglo-American	95/6	—9d
Rhod. Katanga	34/-	—1/9
Rhodesian Selection	21/3	—3d
Rhokana	37½	—¾
Rio Tinto	4 1/16	—1/16
Roan Antelope	11/7½	+4½d
Selection Trust	4 29/32	—1/32
Tanks	8¾	—1/16
Tharsis Sulphur Br.	4⅛	—¼
Tin (Eastern)		
Ayer Hitam	25/3	—3d
Gopeng	17/10½	—1½d
Hongkong	6/7½	—6d
Ipoh	16/9	—6d
Kamunting	11/9	—1½d
Kepong Dredging	6/-	—3d
Kinta Tin Mines	28/3	.....
Malayan Dredging	17/7½	—6d
Pahang	17/7½	+7½d
Pengkalen	19/9	+3d
Petaling	6/7½	.....
Rambutan	20/-	.....
Siamese Tin	15/10½	+4½d
Southern Kinta	21/7½	—3d
S. Malayan	11/9	.....
S. Tronoh	8/10½	+3d
Sungei Kinta	22/-	—3d
Tekka Taiping	9/6	.....
Tronoh	14/1½	+1½d
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	11/1½	+1/3
Beralt Tin	48/-	+1/3
Bisichi	5/6	+7½d
British Tin Inv.	26/-	.....
Ex-Lands Nigeria	2/9	+1½d
Geevor Tin	17/9	—1/9

Tin (Nigerian and Miscellaneous) contd.	Price May 22	+ or — on week
Gold & Base Metal	1/7½	+4½d
Jantar Nigeria	4/6	+10½d
Jos Tin Area	15/3	.....
Kaduna Prospectors	2/-	.....
Kaduna Syndicate	2/6	+3d
London Tin	12/9	.....
United Tin	10½d	.....
Silver, Lead, Zinc		
Broken Hill South	68/9	+1/3
Burma Mines	3/6	—1½d
Consol. Zinc	75/3	+2/6
Lake George	8/9	+1½d
Mount Isa	27/6	+6d
New Broken Hill	47/9	—1/7½
North Broken Hill	5½	+¼
Rhodesian Broken Hill	11/6	+4½d
San Francisco Mines	24/6	+6d
Uruwira	3/-	—1½d
Miscellaneous Base Metals and Coal		
Amal. Collieries of S.A.	2¾	.....
Associated Manganese	37/6	—3d
Cape Asbestos	11/6	.....
C.P. Manganese	26/6	+1/-
Consol. Murchison	49/4½	—7½d
Natal Navigation	3 1/16	—1/16
Turner & Newall	137/6	—2/-
Wankie	18/3	+1½d
Witbank Colliery	5¼	—¼
Canadian Mines		
Dome	$26½	+½
Hollinger	$64	—½
Hudson Bay Mining	$137	—6
International Nickel	$219XD	+2½
Mining Corpn. of Canada	£6¾	.....
Noranda	$102	—2
Quemont	£5¼	.....
Yukon	4/10½	.....
Oil		
Apex	60/-	+5/6
Attock	49/-	+3d
British Petroleum	160/-	+10/3
Burmah	112/6	+9d
Canadian Eagle	83/9	+3/9
Mexican Eagle	20/7½	—4½d
Shell	188/-	+3/-
T.P.D.	90/-	+10/7½
Ultramar	78/3	+2/9

LOWER COPPER DIVIDENDS

As has been disclosed in the quarterly reports of Mufulira and Roan Antelope, the sharp fall in the price of copper over the past year has brought earnings of the producers down with a thud. It has, therefore, occasioned no surprise that Roan and Rhodesian Selection Trust, which holds 64 per cent of the Mufulira equity, have been obliged sharply to reduce their interim dividends on account of the current year.

Roan is cutting its interim to 6d. per 5s. unit subject to Rhodesian tax at 7/6d. This cannot be compared directly with the payment made a year ago since the latest payment is applicable to a capital as increased by a four-for-five scrip issue in February. Allowing for this factor the equivalent payment made a year ago was 11¾d. per unit. For the whole of 1955-56 dividends totalled the equivalent of 2s. 9¼d. per unit

R.S.T., reflecting a reduction in the Mufulira interim from the equivalent of 4s. 5.33d. per share to 3s. 3d., is making a cut from 1s. to 8d. per share, these payments being subject to Rhodesian tax. R.S.T.'s total for 1955-56 was equal to 3s. per share on the present capital as doubled by a one-for-one scrip issue early this year.

All three companies have little more than a month for their current financial years to finish. There can be little room for doubt that a reduction in the final dividends must be expected of the same order as has been seen in the interims.

RIO TINTO CAPITAL

The spreading and growing interests of Rio Tinto have been referred to before in these notes. Mr. Gerald Coke at the recent annual meeting has said that some of the current developments in the group, notably the Empress Nickel Mine in Southern Rhodesia and one or two of the properties of Rio Tinto (Canada), might soon be sufficiently advanced to think about bringing the properties into production.

If this proves to be the case, there would be, he said, some proposals to put before shareholders in due course in connection with the raising of the necessary capital. At this stage, however, it would not be possible to indicate the amount likely to be needed or the shape the proposals might take. The opportunity would be taken to assess the company's capital needs up to the time, probably not before 1960, when some return was likely to be obtained from the equity holdings in Rio Tinto, Canada, and Tinto, Australia.

HIGHER "CASTS" INTERIM

For some time past the suggestion has been heard that the discrepancy between the interim and final dividend payments of Consolidated African Selection Trust was too large. This is now being put right. In declaring a doubled interim of 1s. 6d. per 5s. stock unit the company emphasises that the increase is intended to narrow the difference between the interim and final. That being so, an increase in the total for the current year ending June 30 is not to be expected.

For 1955-56 payments on the 5s. units totalled 5s., this including a bonus of 1s. Estimated net profits for the current year, it is stated, are expected to be approximately the same as those for 1955-56. In that year, of course, the company's financial position had been substantially enhanced by the payment of £1,570,000 compensation from the Sierra Leone Government. No doubt this factor largely prompted the 1st bonus. Consolidated African should easily qualify as an Overseas Trade Corporation in terms of the recent budget concessions and it also is likely to benefit by the Gold Coast proposal to replace the Minerals Duty by a tax designed to be available for double taxation relief.

"WRITS" REVENUE PROSPECTS

West Rand Investment Trust, in the Anglo American Corporation group, is a company whose assets consist largely of big holdings in the operating mines in the Western Transvaal. In his annual review, Sir Ernest Oppenheimer says that an increase in revenue by way of dividends from these far West Rand mines can be expected as the scale of operations continues to expand and full production is reached. Temporary loan facilities have been granted by Anglo American to enable "Writs" to follow up its gold mining investments but at December 31 last only £56,000 had been drawn.

Last year, "Writs" obtained a net profit of £981,000 against £827,000, the whole of which was absorbed with the payment of dividends totalling 2s. on the 10s. shares. At the year end, quoted holdings were given a book figure of £12,800,000 against a market value at that date of £22,500,000.

ANGLO TRUST

Also in the Anglo American Corporation group is Anglo American Investment Trust, the holdings of which are exclusively confined to diamonds. In 1956 income amounted to £3,000,000 compared with £3,100,000 in 1955, the net profit being virtually unchanged at £3,013,000. Dividends again amounted to 100 per cent. Quoted shareholdings were given a balance sheet figure of £3,500,000 contrasted with a market value of £16,200,000. Unquoted investments were unchanged at £4,700,000.

FINANCIAL NEWS AND RESULTS IN BRIEF

Ex-Lands Maintains Dividend.—Preliminary figures issued this week showed that Ex-Lands Nigeria earned a profit of £24,479 after tax in 1956, against £31,173. The dividend of 15 per cent absorbs £24,016, the carry-forward being virtually unchanged at £47,394. Annual Meeting (provisionally), London, June 27.

Bisichi Earns More.—Bisichi Tin Company's profits in 1956 advanced to £163,603 after tax from £139,362 in 1955. A 40 per cent dividend absorbs £105,800 and, after transferring £50,000 to General Reserve, the carry forward is £129,270. Meeting (provisionally) London, June 27.

Central Provinces Manganese.—Central Provinces' net profit for 1956 declined to £451,756 (£646,153), largely due to increased tax liabilities. The final dividend, nevertheless, remains at 2s. 4d. (including a bonus of 8d.), absorbing £350,000. Net current assets at December 31 were £2,063,380. Meeting, London, June 12.

Good Year for Great Boulder.—In the year to December 31, 1956, Great Boulder's profits reached £A258,512 against £A216,369. Dividends totalled 1s. 3d. absorbing £A193,750, and the carry-forward increased to £A62,309. Net current assets were £A457,922. After the general meeting in Melbourne on June 12, an extraordinary meeting will be held in order to transfer the company's domicile to Victoria.

Triefus Has Bumper Year.—In the year ended December 31, 1956, Triefus' profits after tax were almost quadrupled at £83,845. A dividend of 13 per cent is recommended on the Ordinary Shares.

Union Minière Profit.—Union Minière du Haut Katanga's profit for 1956 was 4,632,000,000 Belgian francs, an improvement of 426,000.000 over the previous year. Interim dividends so far this year total 1,400 francs, and a further 900 francs will be payable on May 24.

A Quarterly Review of S.A. Gold Shares

The Publishers of *The Mining Journal* announce the launching of a new publication known as *The Mining Journal Quarterly Review of South African Gold Shares.* The aim of the new *Quarterly* is to provide the investor in the Kaffir market with the essential operating and financial data about each mine, against a background of informed comment and in such a form that it is always up to date.

In undertaking this task, the new *Quarterly* will be carrying on (in what is thought to be a more convenient form) the functions performed over so many years by Sturzeneggers' *The Rand Gold Mines,* which is now incorporated in the new title.

The annual subscription to this new *Quarterly* is £2 2s. 0d. in Europe and £2 10s. 0d. elsewhere (sent by airmail only). A specimen copy of the first issue will be sent free on request to the Publishers, The "M.J." Quarterly Review of South African Gold Shares, 15 Wilson Street, London, E.C.2.

GOPENG CONSOLIDATED, LTD.

MR. D. W. THOMAS'S STATEMENT

The forty-fourth annual general meeting of Gopeng Consolidated, Ltd., was held on May 15 at the Registered Office, Station Hill, Redruth.

Major W. E. Hosking (a director) presiding in the absence of **Mr. D. W. Thomas** (Chairman).

Th Reports and Accounts for the year ended September 30, 1956, having been circulated for the prescribed time, were taken as read, as was also the Chairman's Statement, circulated with the Reports and Accounts, which was as follows :—

The Accounts for the financial year ended September 30, 1956, show a profit of £113,331, after payments to the Malayan Government of £72,860 for Royalty on Ore Sales and the provision of £154,269 for United Kingdom and Malayan Taxation. Four dividends, each of 2/- per £1 stock paid in respect of the year under review, absorbed a nett amount of £91,026. From the available balance £13,812 was written off Capital Expenditure and £8,485 written off in respect of Rubber Estates Replanting Costs. After sundry small adjustments the balance unappropriated at September 30, 1956, was £57,983, an increase over the previous year of £125.

The attention of Stockholders is drawn to the Report of our General Managers, Messrs. Osborne & Chappel, circulated with the accounts, where comparative figures of ground treated, tin ore recovered, etc., are clearly set out. The volume of ground treated was a little more than in the previous year and the recovery per cubic yard slightly higher and, in consequence, the amount of tin ore produced was 849.85 tons as against 758.73 tons during the year ended September 30, 1955. The General Managers anticipate that the same satisfactory rate of production will be maintained during the current year.

From the Moynalpy Estate, a profit of £6,103 resulted; and from the Sanglop Estate, in which your Company owns a half interest, the profit was £1,924.

Stockholders have been advised as follows of the production of tin ore for the first 5 months of the current year :— October, 1956/February, 1957 ... 6,500 piculs=387 tons.

The Security position at the Mine and Estates continues to improve and no incidents occurred during the year.

I have pleasure once again to record our appreciation of the services of the General Managers, the Resident Manager, and the Staff at the Mine and the Estates.

International Tin Agreement

Since the beginning of the current financial year the agreement has become operative and an initial Buffer Stock of 15,000 tons metal, or its equivalent in cash, originally calculated at £640 per ton, is being established.

Producers were of course unlikely to contribute metal at £640 per ton while it commanded a much higher price on the market and, consequently it seemed probable that the Buffer Stock would consist entirely of cash. It has now been announced that the International Tin Council has approved the raising of the floor price, with immediate effect, from £640 to £730 per ton. The complete range of prices therefore become as follows :—

" Below £730 per ton the Manager of the Buffer Stock must buy tin, between £730 and £780 per ton he may buy and between £780 and £830 per ton he may neither buy nor sell. The ceiling remains at £880 per ton, but the Manager may sell when the price is £830 per ton or over."

Since the inception of the Buffer Stock your Company has made the following payments in accordance with the provisions of the International Tin Agreement :—

October, 1956	...	£3,068
November, 1956	...	£3,862
December, 1956	...	£3,173
January, 1957	...	£3,394
February, 1957	...	£2,940

Take-Over Bid

In October, 1956, a take-over bid for the whole of the Issued Capital of your Company was made by a London Finance House. In the opinion of the Board the offer was totally inadequate, and thanks to the support given to the Board by the Stockholders it was rejected by an overwhelming majority. On behalf of the Directors I take this opportunity of thanking Stockholders for their continued support of the Board and its policy.

Repayment of Capital

At an Extraordinary General Meeting held on December 6, 1956, Special Resolutions were passed with a view to repaying 1/6d. on each 5/- Stock Unit. I regret the repayment has, at the time of writing this statement, not been made, but the Petition has been filed and application is proceeding. The Court has, however, required copies of the audited balance sheet and Accounts for the year ended September 30, 1956, to be produced, and so delay has been unavoidable, but the latest advices indicate that the Repayment should be possible shortly before or soon after the Annual Meeting.

It is with deep regret that I have to report the recent death of our co-Director, Mr. Francis Tom Roskrow, who had been a Director of this Company for ten years. Apart from being a most agreeable colleague, he was a mining engineer of great experience and gave unstintingly of his services to the affairs of this Company.

The Statement of Accounts and Balance Sheet, together with the Directors' Report, were received and adopted.

At the close of the meeting the Chairman announced that a second Interim Dividend of 2s. per £1 Stock on account of the profits for the year ending September 30, 1957, had been declared, payable on June 28, 1957.

PENGKALEN, LTD.

MR. D. W. THOMAS'S STATEMENT

The forty-ninth annual general meeting of Pengkalen, Ltd., was held on May 15 at the Registered Office, Station Hill, Redruth.

Major W. E. Hosking (a director) presided in the absence of **Mr. D. W. Thomas** (Chairman).

The Reports and Accounts for the year ended September 30, 1956, having been circulated for the prescribed time, were taken as read, as was also the Chairman's Statement, circulated with the Reports and Accounts, which was as follows :—

The Accounts for the financial year ended September 30, 1956, show a profit of £66,842 after payment to the Malayan Government of £45,209 for Royalty on ore sales and provision of £96,543 for United Kingdom and Malayan Taxation. Dividends totalling 3/6 per share on the Preferred Ordinary shares and 3/- per share on the Ordinary shares have been paid, absorbing a nett amount of £59,225. From the available balance £1,621 was written off Capital Expenditure and £10,000 transferred to General Reserve. The balance unappropriated at September 30, 1956, is £61,730.

Shareholders' attention is drawn to the Report of our General Managers, Messrs. Osborne & Chappel, circulated with the accounts, in which comparative figures of ground treated, tin ore recovered, etc., are given. The total volume of ground treated was 28,600 cubic yards more than in the previous year and, with an improvement in recovery from 0.40 Kati to 0.50 Kati per cubic yard, the amount of tin ore produced was 531.87 tons.

The General Managers anticipate that the rate of output should be maintained during the current year and, as already advised, output for the first six months has been 240 tons.

The Security position was satisfactory and during the year there were no incidents on the property.

On behalf of the Board I have pleasure in recording our appreciation of the services of the General Managers, Resident Manager, Staff and Labour Force at the mine.

International Tin Agreement

Since the beginning of the current financial year the agreement has become operative and an initial Buffer Stock of 15,000 tons metal, or its equivalent in cash, originally calculated at £640 per ton, is being established.

Producers were of course unlikely to contribute metal at £640 per ton while it commanded a much higher price on the market and, consequently it seemed probable that the Buffer Stock would consist entirely of cash. It has now been announced that the International Tin Council has approved the raising of the floor price, with immediate effect, from £640 to £730 per ton. The complete range of prices therefore become as follows :—

" Below £730 per ton the Manager of the Buffer Stock must buy tin, between £730 and £780 per ton he may buy and between £780 and £830 per ton he may neither buy nor sell. The ceiling remains at £880 per ton, but the Manager may sell when the price is £830 per ton or over."

Since the inception of the Buffer Stock your Company has made the following payments in accordance with the provisions of the International Tin Agreement :—

October, 1956	...	£588
November, 1956	...	£2,240
December, 1956	...	£1,904
January, 1957	...	£1,890
February, 1957	...	£1,358
March, 1957	...	£2,327

Take-Over Bid

In October, 1956, a take-over bid was made by a London Finance House for

the whole of the Issued Capital of your Company. In the opinion of the Board the offer was totally inadequate, and thanks to the support given to the Board by the Shareholders, it was rejected by an overwhelming majority. On behalf of the Directors, I take this opportunity of thanking Shareholders for their continued support of the Board and its policy.

Repayment of Capital

At an Extraordinary General Meeting held on December 6, 1956, Special Resolutions were passed approving the repayment of 4/- on both the Preferred Ordinary and Ordinary Shares. I regret the repayment has, at the time of writing this Statement, not been made, but the Petition has been filed and application is proceeding. The Court has however required copies of the audited Balance Sheet and Accounts for the year ended September 30, 1956, to be produced, so delay has been unavoidable, but the latest advices indicate that the Repayment should be possible shortly before or soon after the Annual Meeting.

At the same time, your Directors and Company's advisers are giving active consideration to the question of establishing the respective rights of the Preferred Ordinary and Ordinary Shares, in accordance with their undertaking given at the meeting on December 6.

It is with deep regret that I have to report the recent death of our co-Director, Mr. Francis Tom Roskrow, who had been a Director of this Company for sixteen years. Apart from being a most agreeable colleague, he was a mining Engineer of great experience and gave unstintingly of his services to the affairs of this Company.

The Statement of Accounts and Balance Sheet, together with the Directors' Report, were received and adopted.

At the close of the meeting the Chairman announced that a second Interim Dividend of 1s. per share on both the Preferred Ordinary and the Ordinary Shares on account of the profits for the year ending September 30, 1957, had been declared, payable on June 7, 1957.

ASSISTANT GEOLOGIST

required by

KUWAIT OIL COMPANY LTD.

A University Graduate with an Honours degree in Geology is required by the Company for service in KUWAIT.

Applicants, aged not less than 23 years, should have spent at least 6 months working in subsurface geology including well-siting, sample handling, well-logging and report writing.

Salary according to experience but total pay including local allowance not less than £1,570 per annum.

Write for application form giving brief details, quoting K.2275, to Box S/35, c/o 191 Gresham House, E.C.2.

VIRGINIA O.F.S. GOLD MINING COMPANY

(Incorporated in the Union of South Africa)

HIGHER TONNAGE MILLED

MR. S. G. MENELL'S REVIEW

The 8th annual general meeting of Virginia Orange Free State Gold Mining Company, Limited, will be held on June 20 in Johannesburg.

The following is the circulated review of the chairman, **Mr. S. G. Menell.**

Particulars of the Company's Capital, Debenture Stock, Loan Stock and other loans are given in the Director's Report and I have nothing to add to the information contained therein.

The tonnage milled during the year under review increased by 282,000 tons to 1,016,000 tons and the recovery grade of 4.660 dwt. per ton was 0.404 dwt. per ton higher than in the previous year. The corresponding working profit from gold production, including sundry mining revenue, increased by £265,906 to £487,371. The estimated working profit from acid production amounted to £288,842 and the working profit from uranium for the first full year of production was £1,334,051. The total working profit from all operations for the year was thus £2,110,264. After the addition of Sundry Revenue £1,202 and the deduction of Debenture, Loan Stock and other interest amounting to £423,860, the net excess of Income over Expenditure for the year was £1,687,606.

The capacity of the reduction plant has been increased to 108,000 tons per month and further extensions are in progress.

Uranium Plant Extensions

Extensions to the uranium plant to provide a capacity of 130,000 tons per month were completed early in the year and the treatment of concentrates pumped from the Merriespruit Mine was commenced during March, 1956. Since the suspension of operations at the Merriespruit Mine additional slime has been drawn from your Company's slimes dams to enable the uranium plant to operate at full capacity. A total of 1,479,374 tons of slime were treated during the year and 598,682 lb. of uranium oxide were produced, the recovery grade being 0.404 lb. per ton. The recovery efficiency of the plant was improved during the year and by March of this year was over 83 per cent., which, at this stage, is considered to be satisfactory.

Development footage was increased by 12,248 feet to 53,322 feet, while the footage sampled increased by 4,540 feet to 19,345 feet. A large proportion of the reef development was accomplished in an area situated between 3,000 feet and 5,000 feet north of No. 1 Shaft and between the 25th level and the western boundary, where the average channel width, percentage payability and value disclosed were higher than the averages obtained to date. Compared with the previous year, the Ore Reserve increased by 521,000 tons, the gold and uranium values improved by 0.85 dwt. per ton and 0.119 lb. per ton respectively, and the stoping width increased by 7.0 inches. The accumulated slime available for treatment for the extraction of uranium oxide as at December 31, 1956, was computed to be 271,600 tons, having an average uranium oxide content of 0.380 lb. per ton.

No. 1 Shaft has been deepened to the present required depth of 4,516 feet below the collar to serve the 31st level and thus facilitate the exploitation of the Basal Reef horizon down to the boundary between your mine and the Harmony mine.

The Current Year

During the quarter ended March 31, 1957, 288,000 tons were milled at a recovery grade of 5.317 dwt. per ton, resulting in a working profit, including sundry mining revenue, of £199,013. 397,654 tons of slime were treated in the uranium plant and yielded 201,514 lb. of uranium, resulting in an estimated profit of £511,000. The estimated profit from acid production was £76,269.

Your Board has given special consideration to the provision of adequate underground pumping facilities. It is intended to increase the pumping capacity to approximately 15,000,000 gallons per day to cope with any unforeseeable emergency. An associated problem is the disposal on the surface of the underground water pumped from the mine. This water is unfit for human or livestock consumption, or for agricultural purposes and, consequently, cannot be released into the Sand River because of its polluting effects. Your Company has therefore been obliged to acquire considerable areas of ground to which the water is pumped for evaporation.

As was recently announced in the Press, your Company has entered into an agreement with Merriespruit (Orange Free State) Gold Mining Company, Limited, whereby the Virginia 28th Level Haulage, which is being driven to the common boundary of the two mines, would be doubled and extended into the Merriespruit mining area to a position adjacent to its No. 1 Shaft and that steps would then be taken to dewater the Merriespruit mine by pumping the water to the surface through your Company's pumping system. The Merriespruit Company will bear all the costs of doubling the haulage in Virginia's mining area and of the development once it has entered that Company's property and all costs of dewatering. Suitable safeguards, including your Company's right to terminate or suspend these arrangements will be taken to ensure that these operations will not interfere with your Company's mining activities.

I desire to take this opportunity of placing on record your Board's appreciation of the services rendered by the manager of the mine, Mr. J. L. Halls, his staff and employees, as well as the staffs at both the Head and London offices of the Company.

The Mining Journal Annual Review will be despatched next week to all regular subscribers.

MERRIESPRUIT (O.F.S.) GOLD MINING COMPANY

(Incorporated in the Union of South Africa)

TWO STAGE PROGRAMME FOR RESUMPTION OF PRODUCTION

MR. S. G. MENELL'S REVIEW

The 8th annual general meeting of Merriespruit (Orange Free State) Gold Mining Company, Limited, will be held on June 20 in Johannesburg.

The following is the circulated review of the chairman, **Mr. S. G. Menell.**

Particulars of the Company's Capital, Debenture Stock, Loan Stock and Property are given in the Directors' Report, and I have nothing to add to the information contained therein.

When operations were started at the mine the pumping equipment installed was considered adequate to deal with any inrush of water normally encountered in mines in this area. In addition, in conformity with normal mining practice, all mining was preceded by pilot holes, usually long diamond drill holes, and water bearing fissures intersected in these holes were sealed by means of the injection of cement. Notwithstanding these precautions an unusually large inrush of water occurred on September 14, 1956, on the 31st level and caused a suspension of operations. Production was resumed on September 22, but further inrushes of unprecedented volume on October 19 and 20 flooded the mine and all mining operations were suspended. The events leading up to the flooding of the mine are detailed in the Consulting Engineers' Report. It is a matter of deep regret to your Board that, notwithstanding every possible precaution, seven Europeans and three Natives lost their lives when the water burst into No. 1 shaft. No explanation of this break-through is as yet possible.

During the production period which commenced in March, 1956, 571,000 tons were milled at a recovery grade of 4.923 dwt. per ton, based on a yield which includes 5,604 ounces fine of gold recovered in cleaning up operations subsequent to the flooding of the mine. All the slime from the reduction plant was concentrated in the flotation plant and the product pumped to Virginia Mine for treatment, the uranium oxide produced being 30,434 lb.

Working Profit

The working profit from gold production including sundry mining revenue, amounted to £303,715 and the estimated working profit from uranium production (subject to adjustment) was £62,983, making a total working profit of £366,698. After the addition of Sundry Revenue £802 and the deduction of Debenture, Loan Stock and other interest amounting to £163,076, the net excess of Income over Expenditure for the period February 22 to October 31, 1956, was £204,424.

Immediately prior to the flooding of the mine it was estimated that the fully developed ore available for stoping and payable under the conditions then prevailing amounted to 843,000 tons, at an average gold value of 5.82 dwt. per ton and an average uranium oxide content of 0.177 lb. per ton over a stoping width of 43.3 inches. In addition there were 119,000 tons of ore contained in shaft and safety pillars averaging 5.33 dwt. of gold per ton and 0.134 lb. of uranium oxide per ton over a stoping width of 54.1 inches.

The suspension of operations at your mine necessitated a reduction of the labour strength. The majority of the redundant employees were either transferred to other mines of the Group or offered employment elsewhere.

Trial baling operations were carried out during the period March 6 to April 18, 1957, to obtain information on which decisions could be made regarding the methods to be employed for dewatering the mine.

Salient Features of Proposed Schemes

In Circulars to the Holders of Units of Ordinary Stock and Debenture Stockholders dated April 17, 1957, a programme for bringing the mine back into production was set out. The proposals outlined therein are subject to the consents of the Ordinary Stockholders and Debenture Stockholders of the Company for which purposes the necessary Meetings have been convened for May 20, 1957. The following are the salient features of the proposed scheme which are more fully set out in the abovementioned Circulars:—

(a) A two-stage programme is envisaged. The first stage involves dewatering the mine and a certain amount of development work. To implement this, by arrangement with Virginia Orange Free State Gold Mining Company, Limited, the Virginia 28th Level Haulage which is being driven to the common boundary of the two mines will be doubled and extended into this Company's mining area to a position adjacent to your Company's No. 1 Shaft. Steps will then be taken to dewater the Merriespruit mine by pumping the water to the surface through Virginia's pumping system. The second stage envisages production on a limited scale and further development to permit resumption of production at a normal level.

(b) It is estimated that, on the expected level of costs, the first stage of the programme will be completed at a cost of approximately £1,200,000.

(c) Kennecott Copper Corporation, holder of 97 per cent of the Debenture Stock and all of the Loan Stock, was asked to agree to the first stage and it has so agreed.

(d) To enable the Company to finance the first stage, Kennecott Copper Corporation has agreed "inter alia" to the following amendments to the conditions attaching to the Debenture and Loan Stocks:—

(i) the release of the mine housing from the mortgage bonds held by the Trustee for the Debenture Stockholders;

(ii) a waiver of interest from January 1, 1957, until such time as the Company recommences the production of gold when the rate of interest will be increased from 3 per cent. to 4½ per cent. per annum;

(iii) the extension of the final repayment dates by three years;

(iv) a waiver of the conversion rights attaching to the Loan Stock and the granting to the Debenture Stockholders of certain conversion rights at par.

(e) A contract will be entered into with Virginia Land and Estate Company, Limited, whereby that Company will purchase the mine housing for a sum of £1,700,000 payable as to £1,200,000 over twelve months and as to £500,000 when normal milling for production of gold is resumed.

(f) When the first stage has been completed, the Consulting Engineers will be in a position to make their recommendations as to the second stage.

I desire to take this opportunity of placing on record your Board's appreciation of the services rendered by the manager of the mine, Mr. A. R. Louw, his staff and employees, as well as the staffs at both the Head Office and London Office of the Company.

CONSOLIDATED MURCHISON (TRANSVAAL) GOLDFIELDS AND DEVELOPMENT COMPANY

(Incorporated in the Union of South Africa)

MR. S. G. MENELL'S REVIEW

The 23rd annual general meeting of Consolidated Murchison (Transvaal) Goldfields and Development Company, Limited will be held on May 28 in Johannesburg.

The following is the review by the chairman, **Mr. S. G. Menell,** which has been circulated with the report and accounts:

There was a decline in the demand for, and price of, antimony during 1956, and revenue decreased from £1,516,857 to £1,294,847 A comparison of operations with the previous year shows an increase in the tonnage milled from 139,673 tons to 163,776 tons, and a corresponding increase in expenditure from £469,420 to £514,410. The Ore Reserve was increased by a further 20,000 tons, and at December 31, 1956, amounted to 400,000 tons.

The profit for the year after providing for taxation was £534,790 as compared with £741,060 in the previous year. During the year £3,166 was appropriated for Capital Expenditure, and a provision of £15,000 has been made for a possible loss on the sale of Redundant Stores. Dividends Nos. 24 and 25 absorbed £520,000.

Stocks of ore and concentrates are being kept at the level necessary to ensure that orders can readily be fulfilled.

Since the close of the financial year your Company has exercised an option to purchase the Monarch Cinnabar Mine for £5,750; this property comprising 31 claims adjoins your Company's property and is traversed by the "antimony line."

This concludes my review of the year's operations and I desire to place on record your Board's appreciation of the services rendered by the Secretaries, Anglo-Transvaal Consolidated Investment Company Limited, the Technical Advisers, Johannesburg Consolidated Investment Company, Limited, and the Mine Manager, Mr. E. W. Sahli, his staff and employees, as well as the staffs at both the London and Head Offices of the Company.

THE BURMAH OIL COMPANY LIMITED

A YEAR OF CONTINUED TRADE EXPANSION

SIR KENNETH B. HARPER ON RESTRICTIVE INDIAN POLICY

The fifty-fifth annual general meeting of The Burmah Oil Company Limited will be held on Friday, June 14, 1957, in the Merchants' Hall, 30 George Square, Glasgow.

The following statement by the chairman, **Sir Kenneth B. Harper**, has been circulated with the directors' report and accounts for the year ended December 31, 1956.

Accounts

Once again I am glad to be able to report a year of continuing trade expansion with Group trading profits for 1956 at £7,584,750, an increase of £1,566,576 over the corresponding figure for 1955. Sales continued to expand, while our profit margins were on the whole little different from those obtained in 1955.

I refer later to the formation of a new Rupee Company with Indian participation to take over the oilfield at Nahorkatiya and certain other areas in Assam. Pending the formation of this company we have gone ahead with a comprehensive development programme in the areas to be taken over by it, the cost of which we have carried forward in our Accounts.

Depreciation at £1,243,080 is rather less than that for 1955, in which year there was an exceptionally high charge mainly in respect of the new seaboard installation in East Pakistan.

Dividends from Trade Investments have this year been shewn as part of our trading income in the Consolidated Profit and Loss Account, in order to bring out more clearly the profit arising from all our trading interests. These dividends are brought into account as and when they are received and this year include the first dividend on our holding in Burmah-Shell Refineries Limited. The amount of the dividends actually received during the year from our other main Trade Investments was less than was received last year.

Dividends and interest on Other Investments received in 1956 amounted to £8,018,336 and are £1,082,834 up on 1955, due mainly to larger dividends received on our holdings in The British Petroleum Company Limited and in The "Shell" Transport and Trading Company, Limited.

Full provision has been made for U.K. and Overseas taxation amounting in all to £9,550,543, compared with £7,642,336 in 1955. No account has been taken of the possible effect of the recent budget proposals, but as we already pay relatively little U.K. taxation on our overseas trading profits by reason of double tax relief the benefits that may accrue to us from these proposals are unlikely to be material.

The net profit for the year is thus £7,123,896, compared with £5,990,453 in 1955, an increase of £1,133,443. After adding the balance brought forward from 1955 there is available for distribution £7,764,382, from which falls to be deducted the interim dividend of 5 per cent. paid on the Ordinary Stock on November 23, 1956, together with the dividends on the Preference Stocks. From £6,407,108 remaining for disposal your Board have appropriated £1,650,000 to General Reserve and recommend that a final dividend of 17½ per cent. be paid on the Ordinary Stock on July 5, 1957. This, if approved, will absorb £4,146,710, leaving a balance of unappropriated profit of £610,398 to be carried forward.

The continued expansion of the activities of our Subsidiary Companies and the development of the new productive areas in Assam are reflected in Fixed Assets and Current Assets and Liabilities in the Consolidated Balance Sheet.

Trade Investments increased during the year due mainly to the call up of further capital by the Burmah-Shell Marketing Companies in India and in Pakistan to provide additional distribution facilities to meet the expansion of trade.

Trading

Our Group's own production and purchased oils are marketed by our wholly-owned Subsidiary Companies in Burma, Assam and part of East Pakistan and by Burmah-Shell in the rest of India and Pakistan.

By comparison with the previous year the Group's sales increased by 12 per cent. in Burma, 7 per cent. in India and 2 per cent. in Pakistan.

The increase in **Burma** was satisfactory having regard to the state of the country which is still subject to outbreaks of insurgency despite Government's efforts to suppress them.

The demand for motor spirit tended to slacken off during 1956 but this was more than compensated for by increases in the kerosene and furnace oil offtake. There has been more purchasing power in the hands of the cultivator and the demand for kerosene last year expanded in spite of quite an extensive electrification programme coming into operation. The demand for furnace oil is growing as new industrial units come into commission.

In **Pakistan** a contributing factor to the small increase in sales was some loss of trade in Furnace Oil because of displacement by Sui gas, but to us the loss of the former was partly offset by the latter.

The organisation for the development and sale of Sui gas is now as follows:—

(1) The gas is produced by Pakistan Petroleum Ltd. at Sui.
(2) That Company sells it to Sui Gas Transmission Co., Ltd., who own and operate a pipeline for transmission of the gas to Karachi.
(3) Sui Gas Transmission Co., Ltd., resell the gas for distribution to industrial and other consumers
    (a) on the pipeline route, to Indus Gas Co., Ltd.;
    (b) in Karachi and suburbs, to Karachi Gas Co., Ltd.

Your Company has no financial or management interest in either of the two retail companies, which are 100 per cent. **Pakistani owned.**

Our interest in the ownership and management of Sui gas therefore goes no further than the Karachi end of the main pipeline. Sales of gas were running at the rate of 23 million cubic feet per day at the end of the year. This is less than earlier estimates, partly because the retail companies had not got fully into their stride in this new business and partly because of difficulties in getting import licences for equipment. Sales have been improving steadily this year.

Disappointing in some respects as the rate of offtake was, it has already begun to make a valuable contribution to Pakistan's foreign exchange balances. Last year's sales of gas were equivalent in value to about £1 million in terms of imported fuel oil.

There was a satisfactory expansion of trade in **Assam** which is Digboi's main supply area. The increase was in all products and particularly in furnace oil for which our chief customers are the tea gardens.

In the rest of **India** the distribution of petroleum products was affected by a continuing shortage of tankwagons, but the most marked feature of the trade was an increase in sales of diesel oil for automotive use alongside an almost negligible increase in motor spirit. The increases in our Group's sales of these two products were 31 per cent. and 1 per cent. respectively. The increased demand for the former is in keeping with the encouragement given by the Indian Government to the production of diesel engined vehicles in the assembly works sponsored by them. Imports of petrol driven cars were restricted in favour of cars assembled in India, which were for the most part of the small, lower powered variety.

The petroleum products trade in all our markets and perhaps particularly in India is a "growth industry" and given normal conditions in the domestic as well as the international sphere we can look for a gradual annual expansion in volume. This expansion should become more marked as the Government's industrial plans take practical shape, but expansion calls for more and more facilities and therefore more and more finance. The Government of India has shown appreciation of this position by granting development allowances under its taxation laws. This has been welcomed but it goes only part of the way.

The finance required for expansion of the oil industry has for the most part to be generated by the industry itself, and selling prices must accordingly be allowed to remain at a level to meet this need as well as providing an acceptable return on the capital employed.

Oilfield and Refinery Operations

Burma. Our interest in these operations in Burma is through our 55 per cent. shareholding in The Burma Oil Company (1954) Limited. The Union Government holds one-third of the equity in this Company and is helpful and co-operative, in the spirit of partnership in a joint venture.

The "1954" Company maintained crude oil production at Chauk and Lanywa—the latter field having been developed originally by one of the other shareholders—at the level required to meet Chauk refinery needs, and has since increased it to provide also the required throughput of the new refinery at Syriam, which came on stream in February this year.

The capacity of this new refinery is about one-quarter of our pre-war Syriam refinery which we were ordered to destroy in 1942 to deny it to the Japanese enemy, but the combined throughput of Syriam and Chauk is now sufficient to supply the whole of Burma's present requirements of the main petroleum products, thus making a valuable saving of foreign exchange which Burma has since the war had to find for imports.

Pakistan. Production of crude oil at Balkassar and of gas at Sui is in the hands of Pakistan Petroleum Limited, in which our partners are the Pakistan Government (29.3 per cent) and the

Pakistan public (0.7 per cent). Relations with the Pakistan Government are cordial and the Company receives every assistance from it.

The small quantity of crude oil derived from Balkassar is refined under contract at the Attock Oil Company's Rawalpindi refinery.

At Sui no new wells were drilled during the year. Those already completed are capable of supplying all the gas required for some years to come.

Despite unprecedented floods, the Sui Gas Transmission Company's main pipeline from Sui to Karachi continued to operate successfully, delivering gas to the two Pakistani owned retail distribution companies to which I have referred.

India. Assam Oil Company's new "field" consists of the three contiguous areas near Nahorkatiya *i.e.* the original discovery area, the Nahorkatiya Extension and Hugrijan, and now a fourth area, Moran, about 25 miles to the south-west.

During 1956, out of eleven wells drilled on these areas nine were oil producers, one a gas producer and one a dry hole. All four areas have now been proved and the production target has been raised from one million tons a year, as reported last year, to two-and-half million tons.

Outstanding progress was achieved in increased drilling speeds, with in consequence satisfactory reductions in cost per foot drilled.

It was a condition of the grants in 1953 of concession rights in these areas to Assam Oil Company that if oil were found a rupee company would be formed to develop it and that a prescribed percentage of the equity would be reserved for Indian participation. This percentage has been agreed at 33⅓ and the Indian Government has decided to take up this shareholding interest itself.

Throughout last year and up to the present date discussions have been going on with the Government regarding the formation of this rupee company and in the last few weeks have reached the stage where a formal agreement appears to be in sight. In the course of these discussions our main difficulty has been to reconcile the development of the valuable oilfield we have discovered with Government's restrictive policy towards this kind of private enterprise.

At Bombay, the Burmah-Shell refinery had its first full year of operation and treated nearly two-and-half million tons of crude oil imported from Iran and Kuwait. This refinery company refines crude oil for your Group, Shell and B.P. and the products are sold through Burmah-Shell's marketing organisation.

At Digboi, Assam Oil Company's refinery had a trouble-free year. For many years past it has been quite normal to record that the transport of petroleum products to markets outside Assam had been interrupted by breaches in the railways, through flooding or landslides. In 1956 Assam Oil Company suffered no major interruption to its operations from this cause and, with Nahorkatiya to draw upon to supplement its crude oil production at Digboi, the refinery enjoyed a record throughput.

Prospecting

Burma. During the year the "1954" Company made good progress with the geophysical survey of the Irrawaddy Delta.

The terms and conditions governing future exploration in Burma have been under discussion and this survey was undertaken on assurances received by the Company in that respect.

A test well in the Delta area and another at Ondwe, 30 miles south of our old Yenangyaung field, will be started when formal licences have been granted.

Discussions are taking place between the Government of Burma and the "1954" Company for the grant to the oil industry in Burma of taxation conditions on the same lines as those granted in other countries where the search for oil is recognised as an important industry.

Pakistan. Pakistan Petroleum Limited has continued its vigorous programme of exploration in both East and West Pakistan. A second well at Sylhet in East Pakistan repeated the indication of a useful natural gas field, first disclosed by the well which was destroyed by fire in 1955. Unfortunately no oil was found in either of these wells, but if further drilling confirms results to date this Sylhet gas, while not on the same scale as Sui, should prove valuable to industry in East Pakistan. The development and utilisation of the gas is now under consideration with the Pakistan Government. Meantime the search for oil has moved further south to Lalmai, where a test well will be started in the current year.

In West Pakistan two test wells were started, one is still drilling, so far without success, and the other found poor quality natural gas in considerable quantity but of no commercial value.

Testing continues at the latter well in the hope of obtaining evidence which will assist in the search elsewhere.

The Pakistan Government during the year concluded an agreement with Pakistan Petroleum Limited which provides, mainly by taxation arrangements, additional incentive to the Company's prospecting effort.

India. Apart from continued drilling to prove the value of the concessions at Nahorkatiya, Hugrijan and Moran, no prospecting was undertaken in India during the year.

By a Resolution on Industrial Policy which was announced early in the year, private enterprise is to be permitted in future to prospect for petroleum only by means of a rupee company in which Government itself will have a majority shareholding and therefore the controlling voice. Your Board feels unable to recommend any further expenditure of stockholders' money on prospecting for new areas in India so long as such conditions persist.

Our Group has been prospecting in India for 40 years, though with more disappointments than successes, and has been responsible for developing and producing all the oil that has so far been found in India. We have served both India and ourselves well in the process and we would like to continue to do so, but only on conditions that will benefit both.

Private Enterprise in India

Last year and the year before I referred to the difficulty we were finding in determining the place of private enterprise in India's "socialist pattern of society", because verbal encouragement was not being matched and indeed was being contradicted by legislative and executive measures. There were further instances of such measures last year, for example:

(1) The Seventh Amendment to the Constitution legalised the setting up of State Trading Corporations to compete with normal private enterprise.

(2) The Resolution on Industrial Policy to which I have already referred deprives private enterprise of the opportunity to develop the country's natural resources except as an instrument of Government.

(3) The Finance (No. 3) Act of 1956 contains provisions under which a company cannot qualify for the benefits of depreciation allowances for income tax purposes unless it deposits a substantial part of its current and accumulated profits and reserves, not represented by fixed assets, with the Reserve Bank of India. Any release of the deposits requires the approval of Government.

Each of these measures could directly and adversely affect our business and their cumulative effect is such that it must be taken into account whenever we have to consider investing further capital in India.

Tankers

Our small fleet usually trades in Indian waters, for which the ships were specially designed, returning to the United Kingdom only for Special Surveys or repairs which cannot be undertaken in yards in India and Pakistan. Two of our ships came home for these reasons during the year and both have now returned to the East.

The remainder of the Fleet continued to operate steadily and satisfactorily.

During the year the Government of India acquired their second tanker.

Staff

The staff of all the Group Companies at home and overseas, and on the seas, have given us another year's good service. The East is no longer "unchanging" and new situations constantly arise. Our Managing Directors, Managers and Staffs cope with them with understanding and in an admirable spirit and our gratitude is due to them.

Publications Received

Report No. 31, issued by the Commonwealth of Australia Department of National Development, Bureau of Mineral Resources, Geology and Geophysics, is entitled "Magnetic Results from Macquarie Island 1953." The authors are P. B. Tenni and J. A. Brooks.

*

We have received from the Department of Mines, South Australia, its *Mining Review No. 101*, covering the half-year ended December 31, 1954. This publication is transmitted through the South Australian Government Exchanges Bureau, Government Printing Office, Adelaide, South Australia.

The *1957 Catalogue, Survey and Directory Number* of *The Mining World* covers 350 pages. It is claimed to constitute the only published directory of the U.S. mining industry. Other features include a review of technology and progress during the past year covering 29 different metals and minerals; pictures and descriptions of the best of new equipment; mining reports from all important mining countries; the latest information on possible markets for ores, metals and non-metals; and a review of mining and milling technology during 1956. This valuable publication is available only to subscribers.

ANGLO-BURMA TIN COMPANY, LIMITED

The balance sheet shows some material changes on this occasion, the fixed assets and mining stores having now been eliminated as a result of the sale to the Joint Venture Company. In place of these assets there now appears the Company's holding of 1,100,000 shares of Anglo-Burma Tin Company (1956) Limited, which shares were allotted, at par, as the purchase consideration and which are included in the balance sheet at their sterling equivalent of £82,500.

Current assets amount to £66,963 and, after deducting the current liabilities, we have net current assets of £52,258.

Mining operations by your Company in Burma ceased as at September 30, 1955, upon the sale of your Company's undertaking there.

Consequently, revenue from sales of tin concentrates for the four months of operations was considerably lower at £22,963 compared with £47,357 for the previous complete year.

Total revenue was £25,554 and after charging the Burma and London expenditure, the profit and loss account shows a net loss of £6,176.

Once again I would like to express thanks to Mr. Wilton, Mr. Beetlestone and the other members of the staff who have remained in Burma and have undertaken service with the new Company, the former as its general manager. We therefore feel confident that the technical direction of mining operations is in good hands.

Mining Matters

An international industrial exhibition is to be held in the School of Arts and Crafts of the State Technical University at Santiago, Chile, from September 1 to 25, 1957. Full information about the scope of this exhibition is not yet available but it is expected that such goods as machine tools, road-making and earth-moving machinery, scientific instruments and electronic equipment will be among the exhibits. The total area of the exhibition will be 130,000 sq. m. Stand rents will be on a sliding scale with a maximum of 15,000 Pesos (about £9 at a rate of exchange of 1,623 Pesos to the £), falling to 5,000 Pesos (about £3), per sq. m. for large stands. These prices include illumination and power for the stand, advertising and construction of the stands.

*

The Metal Trades Committee of the International Labour Organization (ILO) ended its sixth session at Geneva on May 18 without reaching agreement on specific problems raised by the introduction of automation.

*

The second international conference on non-destructive testing is to be held simultaneously with the second world metallurgical congress. Both events take place in Chicago, the former November 3-8 and the latter November 2-8, 1957. Sponsor of the non-destructive testing conference is the Society for Non-destructive Testing, Illinois, and sponsor of the metallurgical congress is the American Society of Metals.

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